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ABSTRACT

The Upper Mississippi River ECO-Center is an exemplary Title III, Elementary and Secondary Education Act (ESEA) environmental education project serving the seven school districts of Carroll County, Illinois. The Center has been involved in these aspects of environmental education: outdoor education, inservice training, curriculum development, reference center development, resource development, and information dissemination. This handbook has been designed for use by fifth grade teachers in Carroll County and as an aid to other schools and teachers developing environmental education programs. The activities which have been used and evaluated in the seven county districts, have been used primarily in fifth grade but most could be adapted to other grade levels. Evaluation of fifth grade students during the first 2 years of operation showed a significant increase in environmental awareness. Topics are: implementing environmental education, ECO-Center fifth grade environmental education, environmental awareness, man and the river, man and the elements, sewage treatment plants, school camping, school site activities, classroom instruction, and additional resources. (Author/NQ)

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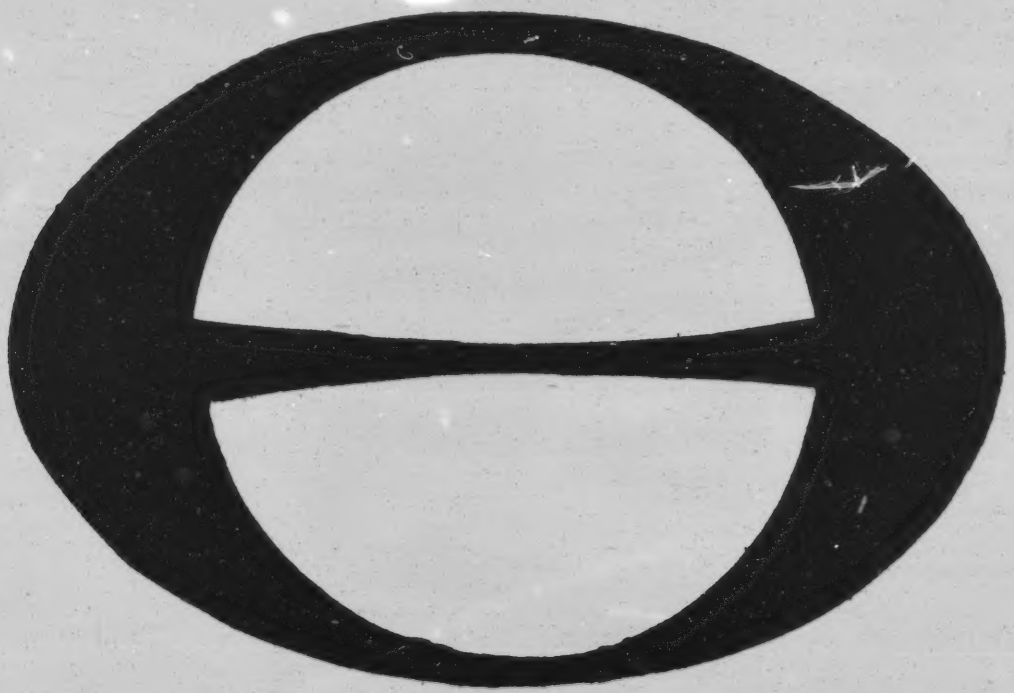

UPPER MISSISSIPPI RIVER ECO-CENTER
Title III ESEA Project
THOMSON, ILLINOIS 61285

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TEACHER'S GUIDE
TO
FIFTH GRADE
ENVIRONMENTAL EDUCATION

PRODUCED UNDER TITLE III-ESEA

by

The Upper Mississippi River ECO-Center

an

Environmental Education Project

Serving Carroll County Illinois

Dennis H. Etnyre, Director

[1974]

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PREFACE

The Upper Mississippi River ECO-Center is an exemplary Title III, ESEA environmental education project serving the seven school districts of Carroll County. The Center has been involved in the following aspects of environmental education: outdoor education, in-service training, curriculum development, reference center development, resource development, and dissemination of information.

This handbook has been designed for use by fifth grade teachers in Carroll County and as an aid to other schools and teachers developing environmental education programs. The activities in this handbook have been used primarily in fifth grade but most could be adapted to other grade levels. The activities have been used and evaluated in the seven school districts of Carroll County. Evaluation of fifth grade students during the first two years of operation showed a significant increase in environmental awareness. For further project information contact the Upper Mississippi River ECO-Center, Thomson, Illinois 61285.

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IMPLEMENTING
ENVIRONMENTAL EDUCATION

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PHILOSOPHY

"We live in a closed life-support system. We have on our spaceship earth, all the air, water and land we will ever have. Space and resources are limited and we are confronted with unprecedented environmental problems. Man has but a short time to become trustee of his inherited land, air and water and to live in harmony with his environment", (Stapp 1972). On how well and how soon the children of today learn this lesson rests the fate of our existence on planet earth. The need for Environmental Education is eminent.

Teacher's Guide to Fifth Grade Environmental Education has been developed with the underlying philosophy that:

Environmental Education Should Have a Clear Statement of Objectives.

Unless goals are set environmental education would become a series of unrelated experiences.

Environmental Education Is Needed At All Levels of the Educational Spectrum.

Education is a continuous process, the fifth grade program represents only one important part of the overall picture.

Environmental Education Is Interdisciplinary.

Environmental education should not be a separate subject but should be part of the existing curriculum.

Environmental Education Should Be Approached From All Facets.

There isn't a single method or approach to environmental education, all aspects of the learning process need to be used. Children do not learn alike.

Environmental Education Includes Outdoor Education.

The real world exists outside the classroom. Environmental study areas need to be established.

. . . . . .

The ultimate goal of environmental education is that of developing citizens that have concerns and responsibility for a quality environment. Such citizens would be knowledgeable about man and his relationship to his environment, concerned about proper management of environmental problems, and be willing to act to solve such problems.

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INTRODUCTION

Today it is becoming increasingly evident that education needs to concern itself with the environment. An awareness of the environment and man's relationship to it must be developed if each student is to function as a responsible citizen who will do his share in shaping a better world in which man may live and mankind survive.

True learning can be achieved only by using all facets of the educational process. This is exceedingly true of environmental education. The classroom is an important but limited part of the educational environment. Lessons, discussions, readings, audio-visual presentations, and local resource persons are all important. The school site and community make excellent environmental study areas. What better way to study the real environment? Here a teacher can better communicate to the students the interdependence and relationships that exist in nature. In order for the school site to be used as an environmental study area, learning activities must be established. Lessons should have clear objectives and allow for student involvement. Field trips to natural and man-made environments are also important parts of environmental education. Field experiences bring the student in contact with the real world as it exists and provide the student with first hand studies of interrelationships between man and nature.

The guide is designed to give teachers a few ideas on implementing environmental education, but is not a substitute for in-service training sessions. Teachers need adequate training and resources to implement environmental education. School districts must recognize their responsibility in meeting this need.

The guide is divided into two parts. The first deals with teacher objectives, activities, and evaluation. The second part deals with the Upper Mississippi River ECO-Center's approach to meeting the teacher objectives, and contains specific objectives and activities for students. The ECO-Center's approach to environmental education is interdisciplinary and provides examples of different teaching methods.

The guide is a resource from which a teacher may select ideas. There are no restrictions placed on the use or reproduction of materials in this guide. Many of the activities may be copied directly for use with students.

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In order for education to produce desired terminal behaviors; objectives must be clearly stated, learning activities developed and coordinated, and evaluation of progress determined at each step of the educational process.

TEACHER OBJECTIVES

In integrating environmental education with the existing curriculum a clear set of objectives must be developed. The major objectives of fifth grade teachers in implementing environmental education are:

I. Cognitive - To assist the pupils in recognizing and understanding the basic environmental concepts that affect life on earth, including use and conservation of resources.

II. Affective - To assist the pupil in developing an appreciation and concern for his environment.

III. Behavioral Skills - To assist the pupil in developing skills necessary for the preservation of the environment.

CONCEPTS, ATTITUDES, AND SKILLS

For any environmental program to meet the above objectives specific concepts, attitudes, and skills need to be identified.

I. COGNITIVE

A. The students should know basic fundamental concepts of the earth's environment.

1. The environment is everything around any organism, all living and non-living things.

2. Life is interdependent. All living organisms are dependent upon other living organisms.

3. All energy comes from the sun.

4. Green plants use the sun's energy, water, minerals, and air to make food which is the source of energy for all living things.

5. All life is dependent upon earth's resources.

6. The earth is like a spaceship and has only a limited amount of air, water, and soil to support life.

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7. Nature does not stay the same but gradually changes (evolves) over a period of time.

8. Natural resources are not equally distributed over the earth. This affects conditions and quality of life.

9. Renewable resources are those that can be produced again; non-renewable resources are limited and can not be produced again.

10. Man is using resources today faster than ever before.

11. Man has the ability to manage and change his environment for good or bad.

12. Man has the ability to damage the ecosystem permanently by misusing earth's resources.

13. For man to survive he must use resources intelligently without permanently interrupting nature's cycle.

14. Wildlife is a necessary part of life and must be managed intelligently.

15. Conservation is the careful preservation and protection of natural resources to insure an adequate supply for the present and the future.

B. Students will be able to enlarge on the preceding fifteen basic concepts.

1. All living organisms and non-living things in an area interact or affect each other. (The "Eco-system")

2. Since each organism depends on some other for food, any interruption in the ecological cycle causes hardship for some other organism in the cycle.

3. Energy is passed on by means of food chains from producer to consumer.

4. Green plants are the only organisms that can use the sun's energy to produce food, so all organisms are dependent on green plants.

5. Natural resources include air, water, soil, and a suitable habitat to live in.

6. Since natural resources are limited man must make wise use of these resources.

7. The constant orderly change in nature is known as succession.

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8. Since natural resources are not evenly distributed over the earth's surface, the quality of life varies from place to place. Man must learn to use available resources wisely. This inequality affects life and results in differences from place to place on the earth.

9. Some resources are renewable. Examples are forests and soil. Other resources are not renewable and once used cannot be replaced. Examples are oil and iron ore.

10. Modern man makes great demands on natural resources. It is only through intelligent conservation that there will be supplies of some resources for the future.

11. Man always changes his environment. It is only through careful management that this change is for good. It is often bad. Multiple use is a good example of careful management.

12. Man may damage his environment permanently. Examples are pollution, erosion, destruction, and waste.

13. Conservation and careful management of natural resources will insure an adequate supply for future use. It will also insure a healthful environment for the present.

14. Wildlife is considered a natural resource and is part of the ecosystem. Careful management will provide for human use and prevent species from becoming extinct.

15. The careful use and management of natural resources is called conservation.

II. AFFECTIVE - To assist the pupil in developing an appreciation and concern for his environment.

A. Man must enjoy, appreciate, and respect his environment.

B. If man is to live in harmony with his fragile environment he must look at his own buying and behavior patterns as well as government, commercial and industrial policies.

C. Man must develop an ecological conscience toward the environment which reflects a commitment of individual and group responsibility to future generations.

III. BEHAVIORAL SKILLS - To assist the pupil in developing skills necessary for the preservation of the environment.

A. Students will learn to think critically about environmental problems.

B. Students will learn problem solving by defining the environmental problem, becoming informed about it, developing solutions, implementing a plan of action.

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TEACHER ACTIVITIES

To meet objectives for environmental education all or part of the following activities should be implemented by teachers:

I. Develop an interdisciplinary approach to environmental education stressing the inter-relationships between man and nature.

II. Develop and use areas outside the classroom.

III. Develop and conduct one day field experiences to local outdoor sites.

IV. Develop local curriculum materials based on behavioral objectives.

V. Identify and use appropriate resource materials.

VI. Provide students with enjoyable and personally satisfying experiences in the outdoors.

It is the purpose of this guide to provide teachers with examples of the above.

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TEACHER EVALUATION

Evaluation should be a continuous process. To check progress made in implementing environmental education teachers may use the following SELF EVALUATION CHECKLIST. Remember individual teachers will approach environmental education from individual strengths.

SELF EVALUATION CHECKLIST FOR IMPLEMENTING ENVIRONMENTAL EDUCATION

EE means environmental education

_____ 1. Have objectives and concepts been clearly stated?

_____ 2. Have objectives and concepts been coordinated with other grade levels?

_____ 3. Have objectives and concepts been coordinated between discipline areas?

_____ 4. Has the teacher been involved in a minimum of 1/2 day in-service training devoted to EE?

_____ 5. Has an average of 40 minutes per week or equalivalent been devoted to EE in the classroom?

_____ 6. Has EE been incorporated appropriately into all subject areas?

_____ 7. Has the class been on an equivalent of 2 all day ecology oriented field trips?

_____ 8. Have at least 5 films and 5 filmstrips appropriately dealing with EE been identified and used?

_____ 9. Has a classroom EE reference area been set up for student use?

_____ 10. Has an EE curriculum guide been developed?

_____ 11. Have at least 2 appropriate resource personnel visited the class?

_____ 12. Has the school site been utilized for at least 5 study activities?

_____ 13. Have activities focused on world, national, state, and local environmental problems?

_____ 14. Have activities been participant centered, and actively involved the individuals?

_____ 15. Has student progress in EE been evaluated?

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ECO-CENTER

FIFTH GRADE ENVIRONMENTAL EDUCATION PROGRAM

Performance Objectives

The objectives of the Upper Mississippi River ECO-Center's Fifth Grade Environmental Education Program are:

Given seven months, pupils in the fifth grade will increase their understanding and awareness of basic concepts of environmental management as demonstrated by achieving a statistically significant gain from pre- to post-test using the Upper Mississippi Environmental Awareness Test.

Given seven months, fifth grade students will demonstrate their improved attitudes toward environmental management by a statistically significant difference in pre- and post-test scores on the Upper Mississippi Environmental Attitude Inventory.

Procedural Activities

To enable fifth grade teachers to meet the objectives, the ECO-Center has implemented the following curriculum reform activities:

1. Program planning with the Department of Outdoor Teacher Education, Northern Illinois University.
2. Development of a series of in-service training sessions for fifth grade teachers.
3. Development of an interdisciplinary classroom approach to environmental education emphasizing the inter-relationships of man and nature.
4. Organization of one-day field trips at local outdoor sites for fifth grade students.
5. Utilization of resources outside the classroom such as the school site and resource personnel. A directory of resources has been developed.
6. Dissemination of information to teachers through newsletters.
7. Development of a library of reference materials and A-V aids. A bibliography of these materials has been developed.
8. Development of local curriculum materials.

Evaluation Technique

Pre- and post-test in September and March using the Upper Mississippi Environmental Awareness Test and the Upper Mississippi Environmental Attitude Inventory. (See Appendix for a copy.)

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The remaining part of this section deals primarily with activities the ECO-Center and fifth grade teachers have implemented for fifth grade students. Each teacher approaches environmental education differently and may utilize all or part of the available activities. Activities are designed to meet program objectives and each activity has been written in behavioral form with student objectives and evaluation.

This section is divided into the following areas:

I. Planning and Conducting Field Trips

II. ECO-Center Fifth Grade Field Trip Program

III. Sewage Treatment Plants

IV. School Camping

V. School Site Activities

VI. Additional Resources

VII. Appendix

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** PLANNING AND CONDUCTING FIELD TRIPS

1. PRE-TRIP PLANNING FOR THE TEACHER

Before taking any outdoor trip, it is a good idea to inform the parents about the trip your class is going to take. Along with the letter it is advisable to send a permission slip and a check list of items students will need for the trip. (See appendix for examples). Although these items take additional preparation time, they are important and will help to avoid misunderstandings.

The classroom teacher must always make the proper arrangements before departing on any trip. These arrangements usually include:

1. Obtaining permission from the school district.
2. Obtaining permission from the owner, manager, or director of the property to be visited is essential. Do this well in advance.
3. Making sure arrangements are made in securing transportation. This may involve transportation just to and from the site or it may be necessary for the bus to remain for the entire trip.

The value of field trips may be dimished somewhat if children are improperly dressed or if the children's behavior is disruptive to the goals of the field trip. It is important to discuss both these matters with the children prior to the field trip. When the children are involved in the decision making, it becomes a real learning situation.

(1) Field trips are very exciting to children. This excitement must be funneled into learning and not just excitement about being out of school. To take advantage of this excitement pre-planning is a must.

1. Pre-Planning
   - A. Decide where you are going and why.
   - B. What are you going to accomplish or solve?
   - C. Members of the class need responsibilities and involvement in the field trip.
   - D. Are you prepared with a knowledge of the materials to be covered on the field trip? This does not imply that you need all the answers, only that you have firmly in mind what the class hopes to accomplish on the field trip.

2. Planning for the Trip Itself
   - A. The length of a trip is important and might make the difference between a good field experience and a poor one.
   - B. Will the weather be a factor? If so, prepare for adequate clothing for children. Stress and restress; There is always someone that will want to go on a field trip ill-prepared for the prevailing weather.
   - C. How will the class conduct itself? Rules of conduct composed by you will probably work if you are tough enough but rules made by the children will provide a better learning situation and usually work just as well.

(1) by Don Jurgs, Director, Bettendorf Outdoor Education Program & Teacher Outdoors, Fall 1973

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2. CONDUCTING THE TRIP (2)

Good leadership on the actual field experience is of critical importance. A few suggestions as to mechanics of directing and leading a group in the field will help make your trip a success:

1. Lead the group, pleasantly but firmly. A sense of positive leadership is the only thing that can focus the attention of each individual on the phenomenon to be studied.

2. Keep the group assembled unless there are special reasons for breaking it up. Don't let it just fall apart or spread out to the extent that communication becomes impossible.

3. Use a visual signal -- usually the right hand raised above the head -- to get attention. This is helpful because you may find more noise than you can cope with without shouting, if you attempt to use the customary vocal call. And shouting at pupils is as bad outside the classroom as inside.

4. When you reach a point at which an observation is to be made, lead about one-half the group past the point, form the entire line into a semi-circle, go back to the point yourself and proceed with instruction and observation. This little "trick of the trade" helps each member of the class to see, hear, and be heard. It avoids what is probably the most common fault of field teaching, that of teaching only the first few people in the line.

5. In many cases, especially in nature or conservation study outdoors, you will want to allow your pupils to "explore". Obviously, the highly organized scheme suggested above will not allow exploration. Your group will need to be broken into committees, or possibly even individuals. In that event, you will need to set definite spatial limits and arrange a signal, probably audible, for reassembly.

Field trips provide fine ways of teaching. But, you should be reminded, fields trips don't do your teaching for you. There is nothing magic or even automatic about them. You still must do the teaching! The trip provides fine materials; but only materials.

It is a good idea to begin any field experience with a review of its purposes. A re-statement of the standards of behavior is also helpful at this point.

(2) Taken in part from "How to Plan and Conduct Field Trips", Donaldson, George and Lou, Oregon, Illinois, Undated.

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3. TEACHING IN THE FIELD[2]

A few general principles of teaching and learning have special application to the field trip technique. They are cited here as reminders:

1. Don't talk too much. The field trip is a time and place for experiencing. Too much lecturing is questionable even in the classroom; in field work it is unquestionably bad.

2. Use sensory experience. Children should see, feel, smell and taste -- as well as hear. All of these, judiciously employed, are possible and good. All have a contribution to make to total learning.

3. Emphasize a few basic concepts. One of your greatest temptations will be that of trying to teach too much. Too many concepts in a short time will serve only to confuse your pupils.

4. Stimulate your pupils' powers of observation. Good use of questions and good leadership of discussion will sharpen the learners' abilities to learn for themselves. What a child discovers for himself is always more meaningful to him than what is pointed out to him.

5. Draw out facts and generalizations from the learners. Use only as a last resort the device of telling pupils in words what their senses are already telling them. Remember, "Telling isn't teaching."

6. Lead your children toward the "how" and "why" as well as the "what" of the situation being experienced. Names of things are important and the "what" should not be ignored. But names alone shed little light. Relationships between things and the process which relate them are more important.

7. Although most of the generalizing and evaluating which you will want to do with your pupils is best done in the classroom after the field trip, you will likely find several points along the way at which you will want to draw together experiences to date or to pin down a particular bit of learning. You should not feel that all such activity must be left for the post-trip period. If you feel the need, do it!

[2] Taken in part from "How to Plan and Conduct Field Trips, Donaldson, George and Lou, Oregon, Illinois, Undated."

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4. POST-FIELD TRIP ACTIVITIES

When a field trip is completed, its educational value is actually just started. Field trips should not be separated from the remainder of the education in the classroom.

1. The generalizations that have been studied on the trip need to be tied together so conclusions may be drawn and goals of learning reached.

2. Portions of a field trip may be used as a motivating factor for classroom assignments. An English assignment, for instance, is far more relevant if the children write about an experience they have just had on the field trip.

3. The field trip may lead to a new discussion or investigation.

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UPPER MISSISSIPPI RIVER ECO-CENTER

FIFTH GRADE OUTDOOR EDUCATION PROGRAM

FIELD TRIPS

I.	Bluffville Environmental Awareness	Sept. - Oct.
II.	Man and the River	Oct. - Nov.
III.	Man and the Elements	Mar. - Apr.

The schedules and activities included under each field trip are only examples. The teacher should not feel locked into a schedule but should feel free to plan a trip to fit the needs of the class.

Each field trip section is arranged in the following order:

1. Data Section - includes logistics necessary for each field trip
2. Pre-trip Planning - includes suggestions for lessons that would better prepare the student for the field trip.
3. Schedule of Activities - a suggested schedule of the day's activities
4. Behavioral Objective(s) - an over all objective for the field trip
5. Specific Activities and Objectives - field trip activities written in behavioral terms
6. Data Sheets or Work Sheets - if any are needed
7. Evaluation - include a test or suggestion for evaluation
8. Classroom Follow Up Activities - for each discipline area

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AFFECTIVE BEHAVIOR

In addition to the goal of cognitive change, on each field trip, attitudes and behavior are equally important. Field trips have tremendous possibilities for developing behavioral patterns that are in harmony with the environment. All field trips include emphasis in teaching toward preserving desired behavioral changes that improve "environmental attitudes". Those emphasized are included in the following behavioral objectives:

Given three ECO-Center field experiences during the school year fifth grade students will:

a. increase their appreciation of the natural environment.

b. increase use of their senses when in the out-of-doors.

c. develop an interest in nature-related activities.

d. decrease the amount of littering on trails.

e. decrease the amount of indiscrimanate picking.

f. decrease the amount of trail-cutting and vandalism on field trips.

g. improve their behavior on field trips.

The technique of evaluation for the above objectives might include teacher observation, or a simple pre-post counting by an observer.

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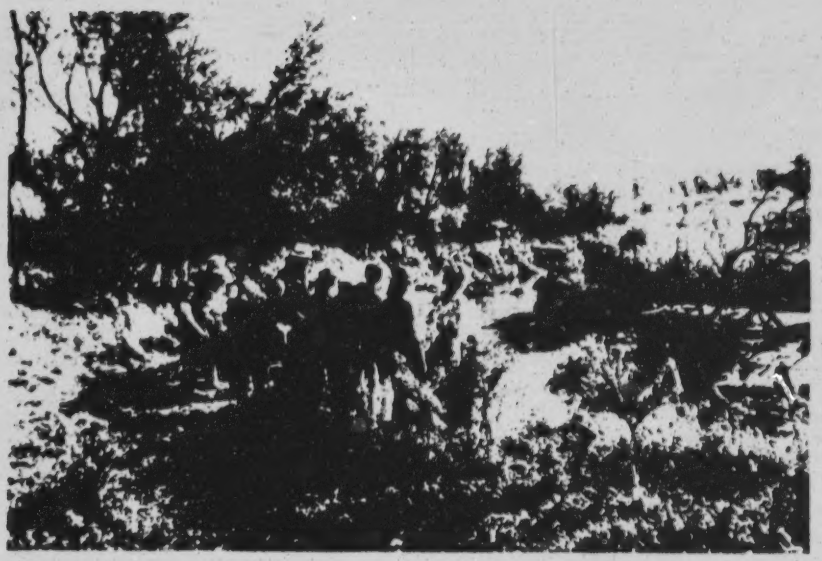
FIELD EXPERIENCE I

ENVIRONMENTAL AWARENESS



BLUFFVILLE OUTDOOR EDUCATION SITE

THOMSON, ILLINOIS

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FIELD EXPERIENCE I

ENVIRONMENTAL AWARENESS

Place: Bluffville Outdoor Education Site, Thomson, Illinois
Bluffville is an 80 acre site owned by the school district and consists of forest, prairie, creek, and marsh. Facilities include: restrooms, school bus for shelter, and a water supply.

Purpose: to study the Bluffville environment as an introduction to environmental concepts.

Transportation: Bus needed just to and from. See appendix for bus trip activities.

Materials and equipment: Sack lunch and drinking cup provided by the pupil. Pencil, paper, and clipboards are provided by the ECO-Center.

Proper dress: The field trip is held in the fall during Sept. and Oct. and temperature may vary from hot to cool. Boots are advisable. Mosquito repellent may be needed on a humid day.

Assistance: An ECO-Center staff member will assist the teacher in conducting the field trip. The use of people from the community to assist might be considered.

Cancellation: To cancel because of weather, call the Center (259-3282) after 8:00 AM. Before 8:00 call the Director. If you call before 7:30 the cancellation could be announced on WCCI.

Pre-trip Planning: Field Experience I

Before departing for Bluffville, it has proven interesting to inform the students about the history of Bluffville and the history of their community. An excellent reference is "Our Goodly Heritage-A History of Carroll County".

Students need to be informed of where they are going, why, and what will be expected of them. Other ideas for preparing the children for the experience include:

1. Using ECO-Center slide presentations
2. Use a film that studies the forest ECO-system such as "Ecology, the Relationship of Plants and Animals to their Environment or Nature's Ever Changing Communities".
3. Use a filmstrip from the "Concepts in Ecology" series such as "Life in Log" or " From Rock to Forest."

Teachers might also want to consider planning an activity for the bus trip such as a litter count or an observation exercise. (See Appendix for an example.)

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Schedule of Activities: Field Experience I

9:00	-	9:15	Arrive at Bluffville, Brief history of the area, orientation to the day's activities, restroom.
9:15	-	10:30	Awareness Hike
10:30	-	11:30	Mini-lessons (Choice of soil, forest, succession, stream, or rotting logs study)
11:30	-	12:00	Lunch
12:30	-	1:00	Free time, obstacle course, charades, games
1:00	-	1:20	Energy and the web of life
1:20	-	2:30	Language arts, arts and crafts, seed dispersal study
2:30	-	2:45	Clean up and departure

Behavioral Objective: Field Experience I

Given a one day field experience at Bluffville Outdoor Education Site, fifth grade students will show an increased awareness and knowledge of environmental concepts and curriculum enrichment as demonstrated by achieving a group mean gain of 5 points from pre- to post-test on the Bluffville test of knowledge, page 30 & 31 .

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Specific Activity: Awareness Hike

Objectives: The students participating in the awareness hike will:

a. be able to list at least two examples of the interrelationships between living things.
b. be able to think of at least two examples of how the (biotic) communities at Bluffville are different. (prairie, forest, marsh, stream).
c. be able to identify several wildflowers and trees.
d. be able to identify two soil conservation practices.
e. be able to describe the natural history and pioneer use of several plants in the area.
f. increase their sensitivity (sight, sound, feeling) to the natural environment.
g. discover homes and habitats of certain organisms.
h. be able to point out where the stream has changed position and describe the succession that is taking place.

Learning Activity

The ECO-leader or teacher will lead a discovery hike around the trails at Bluffville with stops at prairie, forest, marsh, and stream communities to study and discover the interrelationships of the communities present at Bluffville. Breaking the class into smaller study groups will enhance the learning situation.

Evaluation

The student will be able to cite examples of the objectives during discussion session following the hike.

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Specific Objective: Forest Study Using the Senses

Objectives:

Students will demonstrate an increase in their awareness of the aesthetic value of forest areas by using their five senses to explore the forest area.

Students will actively participate in the awareness exercise to develop a sensitization to the forest environment.

Learning Activity

This activity may best be done on a trail by: spacing children along the trail apart but within seeing distance of each other.

Material: none

General Survey

What are our five senses? Can we use them to study the forest?

Sight -
What do you see the most of? Are these things you see the only living things in the forest? What other things could live in the forest? Do you see their homes? Describe everything you see.

Hearing -
While on a trail take a silent hike. Do you hear any sound or sounds in the forest? Describe the sounds. What or who is making these sounds?

Feeling -
What do you feel as you stand in the forest? Describe what it is you feel? What do the trees feel like? What do their leaves feel like? Do all trees feel the same? What do the bushes feel like? What does the ground feel like? Describe all the feelings you are getting.

Smell -
Does the forest have any odors? Do the trees have any odors? The bushes, do they have any odors? The leaves, do they have any odor? Does the ground have an odor? What makes the ground smell the way as it does?

Taste -
There are many things in the forest that can be tasted, but use caution when doing so. Be sure you know the plant!

Evaluation

Self-evaluation: the student could be asked to compare the way he felt about the forest before doing this exercise and after doing this exercise.

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Specific Activity: Energy, Food Chains, and Webs

Objective

Students will demonstrate their knowledge of energy-capture and transfer of energy through food chains by constructing a food web from examples present at Bluffville.

Learning Activity

Have the children sit in semicircles around the leader. The leader would then discuss the following terms with the students, using examples the children have seen at Bluffville.

Sun - original source of energy
Green Plants -- take energy, minerals, water, air and convert these materials to food. Green plants are producers, they are the only organisms that can convert the sun's energy so that it can be stored in food.
Consumers -- animals that live off plants or other animals
Predator -- animal that eats other animals thus getting a portion of that animal's stored energy
Prey -- animal that get eaten
Decomposer -- organism that breaks down material back into its essentials
Food chain -- show how energy is passed on from one organism to another
producer consumer predator
clover eaten by rabbit eaten by fox

Food web - more complex

These concepts can be taught by having children think of examples for food chains from the living organisms at Bluffville. By using cards to label producers, consumers, and predators each child could become part of web held together by string to show the energy transfer.

Materials needed: None at all, or cards, markers, and string.

Follow up -- Draw food webs.
Try to make a food web for everything that lives in an area such as the school ground.

Evaluation

Students will be able to build a food web using examples at Bluffville. Students back in the classroom will be able to draw a food web.

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Specific Activity: Field Study of Soil

Objectives

Upon completion of the field study, students will demonstrate their knowledge of soil by:

a. being able to take a soil sample.
b. identifying the soil layers.
c. being able to tell how soil is formed from natural succession.
d. identifying three conservation methods designed to maintain topsoil.

Learning Activity

Materials needed: soil auger or small shovel, bags if samples are to be taken

Take soil samples from a prairie area and from the forest. Ask children the following questions about the soil they have sampled comparing the areas:

What do you see?
Do you see any small animals? What animals are most likely to live in the soil? Are there any layers in the soil? How many? What are these layers? What is the texture of the soil? Who or what benefits from the soil? How was the soil made? How can the topsoil be kept from eroding?

Discuss how the soil is made. This would include weathering, water, freezing, plant growth, and erosion (water, wind).

There are many follow-up studies that could be made back in the classroom.

Reference: MacKillican, William. Studying Soil. Toronto: The Ryerson Press, 1970.

Evaluation

Teacher observation, no formal evaluation is planned.

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Specific Activity: Field Study of a Rotting Log

Objectives

Students will demonstrate their knowledge of log decomposition by being able to identify or explain.

a. three forces of nature that help to decompose
b. three organisms that help to decompose
c. three ways plants help to decompose
d. the end product of decomposition

Learning Activity

Materials needed: rotting log. No other material is necessary. Magnifying glasses, insect and fungi guides are helpful.

General survey before detailed study

Old log or newly fallen tree? How can you tell?

What happens when a tree falls? What forces of nature go to work on dead tree?

Where is this tree located? Does its location have anything to do with the rate of decay?

I. Forces of nature
   A. Weather
      1. Rainfall
      2. Frost
   B. Forest Cover
      1. How effects decay
      2. Compare with log in more open area.
      3. Compare with log in a swampy area.

II. Insects
   A. Kinds
   B. What they do
   C. Examples
   D. Why more in some places than in others?

III. Plants
   A. Lichens
   B. Fungi
   C. Small plants

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Specific Activity: Field Study of a Rotting Log (cont.)

Learning Activity (cont.)

IV. Work of plants

A. Root systems

B. Acids

C. Moisture preservers

D. Plant succession

V. Final decay

A. Final result

B. Good of this

VI. Reasons for leaving the log undisturbed

A. Enriches forest

B. Other people may want to study it

Evaluation

Teacher observation of learning experience. Student drawing of organisms that decompose, or teacher-made quiz.

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Specific Activity: Field Art Project

Objective: The student as a result of the art project will:

a. produce an art project using native materials.
b. be able to identify shapes, colors, and textures in nature.

Learning Activity

The following are examples of simple art projects that could be done at Bluffville without extensive materials. The teacher is reminded to only use materials that are abundant and the depletion of which would not affect the ecosystem at Bluffville. The staff member in charge will set collecting policies as they will vary with season.

Burdock Art

Gather burdock burs. Shape into baskets. Fill the baskets with dried weeds, grasses, etc.
Shape the burs into animals, birds, or insects. Twigs or leaf stems may be used for legs, ears, and whiskers.

Leaf Art

Collect large leaves. Carefully break the stems from them. Overlap the leaves and use the stems as pins to fasten them together. Make headbands or leis. These may be decorated with flowers or other interesting plants. Use only weed flowers such as Queen Anne's Lace or abundant plants.

Weathered wood, bark, dried materials, or other natural materials.

Interesting arrangements may be made with weathered wood, bark, colored rocks, dried grasses and weeds, branches, or almost any material found on a field trip.

All of the above activities require no other materials than those found on a field trip.

Another idea might be to gather materials to take back to the classroom for a display. Again, rules need to be set on collecting.

Natural Soil

Blue clay - shape jar, vase, or some object.
Colored sand - sand paintings

Tracings - Sketches

Take chalk, crayon, or pencil to make tracings or sketches of natural materials.

Evaluation

The student will complete an art project using approved materials.

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Specific Activity: Language Arts

Objective: Students after completing the language arts activity will demonstrate their ability to perform one or more of the language art skills using the Bluffville environment as a subject source.

Learning Activity

Materials needed: Pencils, paper, clipboards. Copies of poem "September".

Suggested field work:

Alliteration

Alliteration is the repeating of the same beginning letter. You name something and then think of a word beginning with the same letter to describe it. For example: bee, bumble bee Now try to think of two words to describe it. big bumble bee. See how many you can find. An example is big, black, buzzing, bungling, bumping, bumble bee.

Similes

Similes are comparisons using like or as. An example would be: The wind whining like a puppy.

This is a good time to use what you have learned when you closed your eyes and listened or when you smelled something. Use any of your senses.

Poetry study

You have a copy of Helen Hunt Jackson's poem, September. (See next page) Listen while I read it to you. As we go along underline the things the author mentions as coming in September. Have any of you seen any of these things today? Where? Have you seen rose hips or haws? They belong to the same family as apples. When you go back to your classroom you may want to bring some of these things and make a table display to illustrate the poem. Another thing you can do is find pictures to illustrate it and make a bulletin board.

Cinquain

The cinquain is a five lined poem used by the Italians. It is very simple to write.

First line: Use one word giving a title.
Second line: Use two words describing the title.
Third line: Use three words showing action.
Fourth line: Use four words showing a feeling about the action.
Fifth line: Use one word that is a synonym for the title.
(Example on next page.)

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Frog

Green, glassy-eyed

Jumps, croaks, swims

Plopping into the pond

Croaker.

Teacher follow-up:

Use field trip as a subject for original writing instead of suggested titles in text. Share the appreciation developed of field trips with other classes, or parents.

Evaluation

Students will complete a cinquain, alliteration, or simile.

- - - - -

September

by Helen Hunt Jackson

The goldenrod is yellow;
The corn is turning brown;
The trees in apple orchards
With fruit are bending down.

The gentians' bluest fringes
Are curling in the sun;
In dusty pods the milkweeds
Their hidden silk have spun.

The sedges flaunt their harvest
In every meadow nook;
And asters by the brookside
Make asters in the brook.

From dewy lanes at morning
The grapes sweet odors arise;
At noon the roads all flutter
With yellow butterflies.

By all these lovely tokens
September days are here,
With summer's best of weather,
And autumn's best of cheer.

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Specific Activity: Seed Dispersal

Objective:

Students will demonstrate their knowledge of how seeds are spread by identifying methods, gathering examples, and classifying the examples on the seed chart.

Learning Activity

1. Discuss with the class what seeds are and how they are spread. Emphasize that man is the biggest carrier of seeds and this can be either good or bad for the environment.
2. Hunt for different types of seeds and figure out how they are spread.
3. Have each child find one seed to represent each method on the seed dispersal sheet.
4. Complete the assignment by placing each seed under the proper classification on the seed dispersal chart.

Methods of dispersal:

		Examples
I.	Wind-borne seeds	
	A. Winged seeds	maple
	B. Seeds with parachutes	dandelion
	C. Wind scattered	ragweed
II.	Hitch-hikers	
	A. Sticky seeds	wild radish
	B. Burs	burduck, cocklebur
III.	Animal carriers	
	A. Animals that bury seeds	squirrels
	B. Animals that cache seeds	chipmunks
	C. Man	
	1. Discarding seeds	
	2. Unintential carrying	
	3. Intentional planting	
IV.	Seeds that pop from plants (touch-me-not)	
V.	Water-borne seeds	lotus, walnut

Follow Up - Discuss back in class man's interference with the natural cycles of seed dispersal. What does man do to control unwanted plants. Can some methods be harmful to the environment. Are there alternatives?

Evaluation

Students will complete the seed dispersal classification sheet.

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SEED DISPERSAL

Wind-borne Seeds			Others
Winged Seeds	Seeds with Parachutes	Wind Scattered	Hitch Hikers
Birds	Animals - People	Pop from Plants	Water

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BLUFFVILLE TEST OF KNOWLEDGE

1-6 Place the letter of the correct answer in the blank.

1. The only organisms that can use the sun's energy to make food are ____

   a. men.
   b. mushrooms.
   c. fish.
   d. green plants

2. When walking on a hilly trail, you may prevent erosion by _____

   a. zigzaging.
   b. turning around and going back.
   c. walking straight up or down.
   d. running.

3. When a tree falls it _____

   a. turns to rock.
   b. rots back to soil.
   c. just lies there.
   d. turns to gas.

4. The greatest single scatterer of seed is _____

   a. man.
   b. water.
   c. wind.
   d. animals.

5. A stream _____

   a. never leaves its banks.
   b. never changes direction.
   c. follows the path of least resistance.
   d. always flows straight.

6. Stream banks erode fastest when _____

   a. the banks are grassed.
   b. the banks are bare.
   c. banks gradually slope.
   d. banks are rock covered.

7. Complete the following food chain: (1 pt)

   Clover-----> _____ -----> _____.

8. Name three forces of nature that help decompose. (3 pt)

   a. _____
   b. _____
   c. _____

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BLUFFVILLE TEST OF KNOWLEDGE

9. Give two ways in which soil may be conserved. (2 pt)
   a. _____
   b. _____

10. Give three ways by which seed may be scattered. (3 pt)
   a. _____
   b. _____
   c. _____

11. Complete the following cinquain. (1 pt)
   a. _____

12. Green plants need four things to make food. What are they? (4 pt)
   a. _____
   b. _____
   c. _____
   d. _____

13. You are on a hike in a forest area. Name one thing you might become aware of through each of your senses. (5 pt)
   a. seeing _____
   b. hearing _____
   c. feeling _____
   d. smelling _____
   e. tasting _____

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FOLLOW-UP ACTIVITIES

The following activities have been developed by fifth grade teachers as samples of activities that could be used following the Bluffville field trip. Activities have been developed for each discipline.

ACTIVITY: To write a "Thank-You" letter to the ECO-Center, princial, school board, or parents.

DISCIPLINE AREA: Language Arts

PURPOSE:

1. To help students realize that courtesy is an important part of co-operative living.

2. To teach pupils the correct format in writing a letter.

OBJECTIVES: The student will be able to:

1. construct a letter using the proper friendly letter form emphasizing spacings, punctuations, handwriting, and spelling.

2. correctly address an envelope.

LEARNING ACTIVITY:

1. The teacher should instruct the class on how to write a letter and address the envelope.

2. The letter is to be thanking someone involved in the field trip, such as the ECO-Center, or the principal or superintendent.

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BLUFFVILLE

FOLLOW-UP ACTIVITY

ACTIVITY: To set up an environment which displays the earthworm's activity in the soil.

DISCIPLINE AREA: Science

PURPOSE:

1. To help students learn about the earthworm and the contribution it makes to man through life in the soil.

OBJECTIVES:

The student will be able to write a paragraph telling how the earthworm plays an important role in building our soil.

LEARNING ACTIVITY:

Construct an earthworm farm using:

1. a transparent container and covering 3 sides with any dark material to create a realistic earthworm environment.

2. Place in this container the following layers of material:

   a) coarse material (pebbles, rocks)
   b) sandy clay or a sandy clay mixture
   c) silt
   d) semi-decayed matter (humus)
   e) newly fallen twigs, leaves
   f) a number of earthworms suitable to volume of container.

3. Maintain an atmosphere suitable to the preservation of the earthworm's environment.

4. In a separate container establish a control by developing a similar environment following No. 2 steps a-e (leaving out the earthworms)

* If the container is of suitable size, it may be divided into two parts - one being the control and the other the actual earthworm farm.

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BLUFFVILLE
FOLLOW-UP ACTIVITY

ACTIVITY: Comparing the area and perimeter of Bluffville to a school site.

DISCIPLINE AREA: Mathematics

PURPOSE: To help students better understand the concepts of area and perimeter.

OBJECTIVES: The students will be able to:

1. distinquish between the concepts of area and perimeter by calculating the area and perimeter of the school site.

LEARNING ACTIVITY:

1. The teacher will supply a model containing the dimensions of the Bluffville Site (See page 36) The students will then calculate the area and perimeter of this region.

2. Using a tape measure, a yardstick, a meter stick, a land measuring wheel, pacing or any other device suitable for measuring, the students will find the dimensions of their school site.

3. The students will compute the area and perimeter of the school site they measured as compared to the area and perimeter of the Bluffville Site.

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BLUFFVILLE
FOLLOW-UP ACTIVITY

ACTIVITY: Making a relief map of the Bluffville Site

DISCIPLINE AREA: Social Science

PURPOSE: To emphasize a visual awareness of the geographical features of the Bluffville Site

OBJECTIVES: The students will be able to:

1. construct a relief map of a geographical area given the suitable background experience.
2. develop rules and regulations necessary to manage the area.

LEARNING ACTIVITY:

1. The teacher will have the students prepare at home a mixture of 1½ cup salt to 1 cup of flour and add water until the mixture is of the consistency of play dough. Knead well. Place in covered container.
2. Each child should have a masonite sheet - size is up to discretion of the teacher.
3. Teacher will supply each student with a flat map of the area indicating timber areas, marsh land, creeks, etc. See page 36.
4. Student will create a facsimile of the flat map on the masonite.
5. Using the clay-like material construct the geographical features of the Bluffville Site. Allow to dry for approximately 2 days.
6. Establish a legend and paint areas with corresponding colors of tempera paint.
7. To keep this area for ecology study, what management problems may be visualized from an awareness of the geographical features of the site? What rules, regulations or restrictions on human activity can the students suggest to maintain the environmental qualities of the site while using it for study purposes. Should areas be set up for certain activities such as hiking, picking, work projects, etc.

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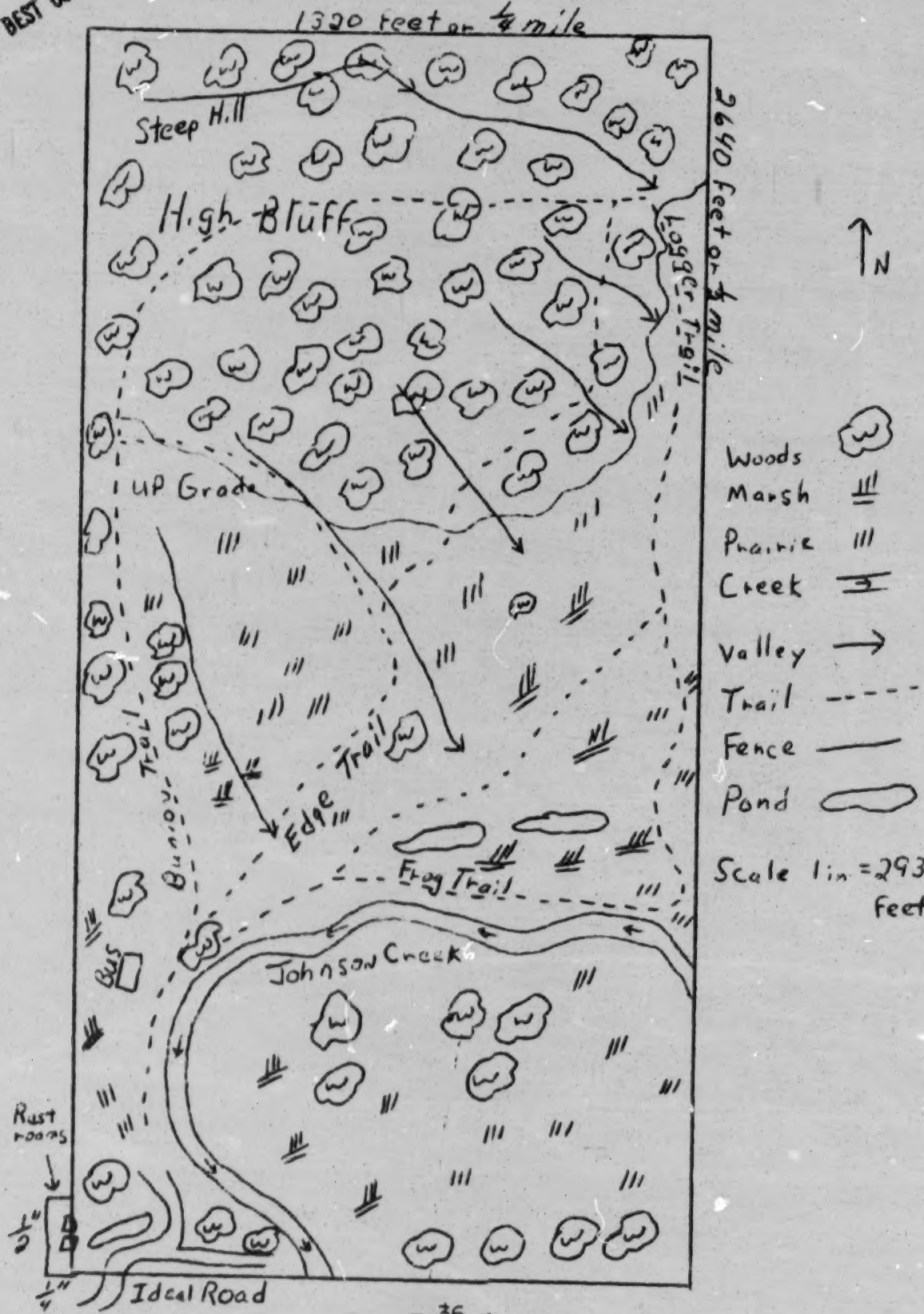
BLUFFVILLE OUTDOOR EDUCATION SITE



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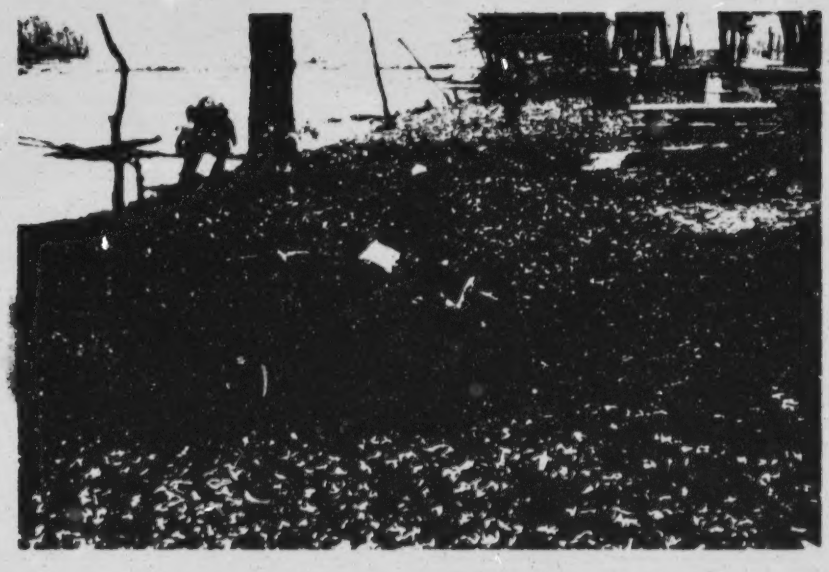
FIELD EXPERIENCE II

MAN AND THE RIVER



MISSISSIPPI RIVER

CARROLL COUNTY

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FIELD EXPERIENCE II
MAN AND THE RIVER

Place: Lock and Dam #13, Potter's Marsh, ECO-Center, River, Spring Lake Wildlife Refuge

Purpose: To study the river, aspects of river development and man's influence both positive and negative.

Transportation: A bus will be needed all day. See appendix for bus trip activities.

Material and Equipment: Sack lunch. We will eat at the ECO-Center; other materials provided by the ECO-Center. Bring binoculars if possible.

Proper Dress: The field trip is held during October and November. At times the weather can be extremely cold and this can not be overemphasized. Dress warmly, this includes thermal underwear, gloves, boots, and a covering for the head.

Assistance: An ECO-Center staff member will board the bus in Thomson on the way to Lock and Dam 13. Adequate supervision at the lock is necessary.

Cancellations: This field trip is seldom cancelled unless the weather is extremely adverse. The bus is available for children to get out of the weather. To cancel call the Center (259-3282) or the director.

PRE-TRIP PLANNING

General suggestions for planning field trips are included under Planning and Conducting Field Trips. A review of this material might be worthwhile.

To set the stage for a busy and rewarding day some background information on the river and its history has been included. To make the trip more effective it is suggested that time be spent presenting this material to the class prior to the field experience. This will give the student a clear direction on what is to be studied and a historical perspective of the Mississippi River. This material could be used as a history lesson.

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CLASSROOM PRESENTATION

Purpose: To provide each student with a background of the history of the Mississippi River in this area prior to the field trip.

The history of the Mississippi River goes back to a time before European settlers had ever heard of it. The history starts with the French settlements along the St. Lawrence River where the earliest settlement was at Quebec in 1608.

The French soon found that the Indians were eager to trade furs for cloth and blankets, iron kettles, knives and axes, guns, and trinkets. The most valuable of these furs was the beaver which was much wanted in Europe. Soon the fur traders, called voyageurs, were pushing west traveling in birchbark canoes and using the natural waterways. With them went Jesuit priests as Catholic missionaries to the Indians. Within sixty years these men had pushed as far west as Sault St. Marie, the straits between Lake Superior and Lake Huron where they founded a settlement in 1668. (Transparency #1) See Page 42.

The Indians kept telling the white men of a great river to the west. Explorers hoped this great river would lead to the Pacific Ocean and would be a short cut to Asia for the only route so far discovered was south around South America, a long, dangerous voyage. If the great river led to the Pacific, ships could travel up the St. Lawrence to the Great Lakes, through them to the great river and thus into the Pacific. As no one had any idea how wide North America was or had ever heard of the Rocky Mountains, the accepted ideas was that this was a simple voyage.

Two men, Father Pierre Marquette, a Jesuit priest, and Louis Joliet, a voyageur, decided to find the river.

They started from Sault St. Marie with Indian guides, went down Lake Michigan to Green Bay, through the bay and up the Fox River. Here where the city of Portage now stands, they carried their gear and canoes overland to the Wisconsin River. They went down the Wisconsin River to where it finally entered the great river now called the Mississippi.

They followed the Mississippi south as far as the Arkansas. By now they knew that the Mississippi did not flow into the Pacific Ocean but into the Gulf of Mexico. Indians warned them of fierce tribes in the area, so here they turned back. They returned to Sault ST. Marie by the way of the Illinois and Des Plaines Rivers to the southern end of Lake Michigan and then up Lake Michigan.

For many years the French explorers and traders explored this area and traded with the Indians, but the French made only a few settlements, the most important of which were St. Louis, Kaskaskia, Vincennes and New Orleans.

During the French and Indian Wars the French lost Canada and all of their territory east of the Mississippi to the English.

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The English did not do much with the area and it was not until after the Revolutionary War that settlers began moving into this country. When the new United States was organized the country north of the Ohio, east of the Mississippi and south of the Great Lakes was called the Northwest Territory and was opened to settlement.

The easiest way for the settlers to reach the new country was by using the rivers. At first they used canoes and rafts. Later they developed the keelboat which could carry larger loads and be steered. After the settlers began producing surplus crops these were carried to the New Orleans market by raft and keelboat.

After the Louisiana Purchase, the entire Mississippi and the city of New Orleans became American. Then the steamboat was invented. It became an instant success on the inland rivers for now goods could be carried up the river as well as down.

Steamboats carried settlers and their goods into new areas and carried produce out. Large cargoes of horses and other livestock besides supplies were shipped to the settlers and grain and meat were shipped out.

Another product shipped out was lead from the Galena area. Countries at war in Europe needed large amounts of lead for shot and bullets so the price of lead soared. Galena became the largest and wealthiest city in Illinois. Because lead ore was so valuable it was known as "gray gold". Much of this lead was shipped out on steamboats on the Mississippi because boats could carry large cargoes of the heavy ore and move it faster than horse drawn wagon trains could.

The early steamboats used wood as fuel and made stops at regular woodyards along the banks. Many settlers earned their livings or made extra money by providing wood for these yards. The river valleys were heavily forested, so there was no problem in getting the wood. As the valleys were cleared, farmers took over.

The great age of steamboating was between its invention and the Civil War. During the War the river was closed to traffic, and by the time the war was over railroads had been extended so far into the country that people no longer depended on the river.

Of course river traffic did not stop altogether, but the boats now used were smaller working type tows. From the 1800's to about 1900 was the great lumbering age of Wisconsin, Michigan, and Minnesota. Thousands of logs would be linked together into great rafts and floated down the river to mills where they were sawed into lumber. Many river towns, among them Clinton, Iowa, got their start as lumber towns.

One difficulty with river traffic was that the river varied so much in depth. During the spring, flooding would prevent traffic and during the summer the water would get too low for steamers to use the river.

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During the 1930's Congress authorized the U. S. Army Corps of Engineers to construct a series of twenty-seven dams from St. Paul, Minnesota, to St. Louis, Missouri, to maintain a 9-foot channel in the upper river. This resulted in a great increase in river shipping, and changed the character of the river valley.

Because the river was backed up behind dams, in many places the valley was flooded and new islands and sloughs were formed. This resulted in loss of valuable farm and timber land and was detrimental to the environment in other ways. Most islands are now under water. The Corps of Engineers has developed many recreation areas along these backwaters, while the Fish and Wildlife Service of the Department of the Interior has set aside vast acreages as game and wildlife preserves.

Probably the greatest change has taken place in the amount of river traffic. Now all the boats are powerful diesels capable of pushing up to fifteen huge tows. In 1940 total tonnage through Lock 14 at Bettendorf was 2,000,000 tons. By 1971 the tonnage was 21,304,306 tons, and it has increased since then. Greatest tonnage upstream through the dam is in coal and oil, and the greatest tonnage downstream is in grain. Other large shipments include cement, molasses, fertilizer, and lumber. On the lower river sulfur and sugar make up the greatest tonnage. Many other products are shipped in lesser amounts including such oddities as salad oil and nail polish remover.

During the field experience you will visit Lock and Dam 13 where government personnel will take you over the dam and expalin how it and the locks work. If you are lucky you will see a tow locking through. Following the tour, both the negative and positive aspects of the contruction of the lock and dam system will be discussed. Students should consider whether further deeping of the channel (12 foot channel) would benefit man enough to outweigh the damage done to the ecosystem; also to be considered is the cost to the public for maintaining the lock system and the cost of additional projects.

Next you will visit a public use area. Here you will see a marsh and a public use area, and will be asked to observe the influence of the dam on the region for both good and bad.

During the afternoon you will drive through a housing development along the river and discuss its effect on the area.

The last stop will be at the Spring Lake Wildlife Refuge; here you will study water fowl management. You will see great flocks of migrating ducks, geese, and swans. You may also see permanent wildlife residents such as cardinals and deer. Discuss with the class the necessities for managing wildlife and why there must be rules and regulations regarding hunting.

For additional information see the sheet on the Spring Lake Wildlife Refuge.

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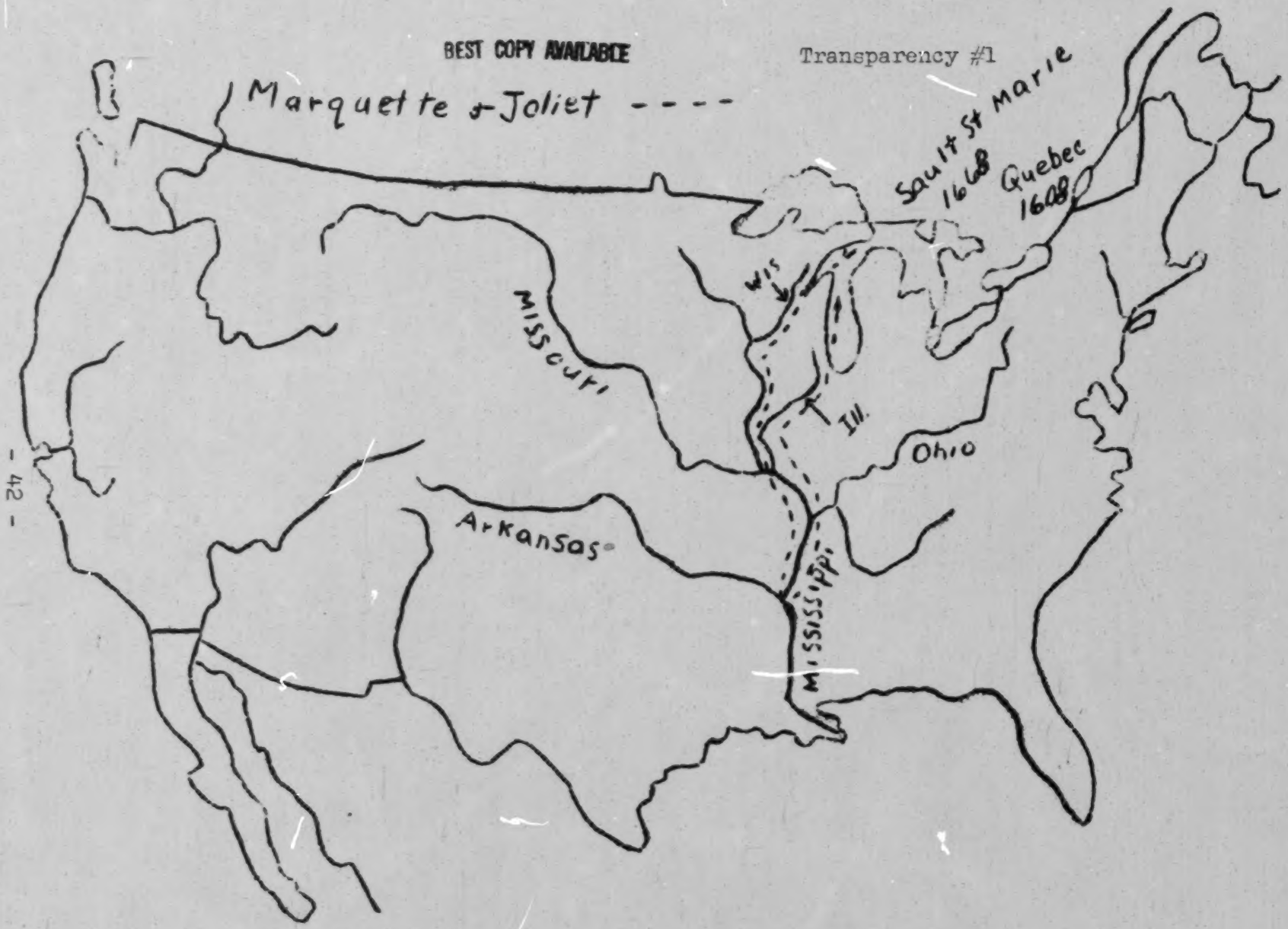
Transparency #1



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Schedule of Activities: Field Experience II

This all-day experience is one which will take the students to a variety of stops along the river, all of which show the influence of man on the river. The timetable below will explain what will take place during the day. Also enclosed are two work sheets used during the trip.

TENTATIVE TIMETABLE FOR SECOND FIELD EXPERIENCE

9:15 - 9:30	Arrive at Thomson	
9:30 - 9:45	Arrive at Lock & Dam -	Enroute to Lock & Dam, additional information concerning history, commercial and environmental effects of the Lock & Dam will be discussed with the students.
	Tour Lock & Dam -	If possible lock master will give tour and lecture of the operation and management of the Lock & Dam. Also commercial aspects will be discussed during tour. This tour is made possible through the cooperation of the Army Corps of Engineers.
11:00 - 11:15	Leave Lock & Dam -	Discuss pros and cons
11:15 - 11:30	Arrive at Potter's Marsh -	Enroute, discussion will center on the creation of Potter's Marsh by Lock & Dam.
	Tour Potter's Marsh -	The tour will center around environmental impact of the development of Potter's Marsh and the surrounding area into a recreational area. The students will demonstrate their ability to determine the environmental impact on areas.
12:00 - 12:15	Leave Potter's Marsh	
12:10 - 12:25	Arrive at ECO-Center	
12:20 - 12:35	Restroom	
	Lunch	Group discussion of impact study.
1:00	Leave ECO-Center	
1:25	Arrive at Riverview -	Enroute to area, discussion will include man's effect on the river and river's effect on the economy.
1:35	Leave Riverview	
1:45	Arrive at Wildlife Refuge -	Enroute to the refuge information will be given on the hisotry, development and purpose. The National Wildlife Refuge water fowl management techniques will be explained concerning the Spring Lake Closed Area.
	Tour Refuge	
2:45 - 3:00	Leave Wildlife Refuge and return home.	

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Behavioral Objective: Field Experience II

Given a one day Man and the River field experience, 80% of the fifth grade students will show an increased understanding of the Mississippi River Environment as it exists in Carroll County as demonstrated by a mean gain of 5 points from pre-to post-test on the Man and the River Test.

Specific Objectives:

Lock and Dam

Students will demonstrate their increased understanding of the importance of the Mississippi River to the local area by being able to identify at least one example of each of the following: historical significance, development, management, commerce, and environmental concern.

Students will be able to identify at least one example of each of the following aspects of the Upper Mississippi lock and dam system: need, history, construction, purpose, mechanical operation, and effect on the surrounding environment.

Learning Activity:

Students should be given the pre-trip background information prior to the experience. On the way to the lock and dam a staff member will explain the history and need for the system. At the lock if permission is obtained, students will receive a tour of the facilities and have the mechanical operation explained. Upon leaving the lock, there will be a discussion of the good and bad effects of the lock and dam system and detrimental effects of future projects.

Evaluation:

No formal evaluation planned.

Specific Objectives:

Potter's Marsh

Given a one hour period, students will be able to recognize changes that have been made in the Potter's Marsh environment to develop a public use area, and be able to assess the effects on the local environment as demonstrated by filling out the Potter's Marsh Impact study sheet.

Learning Activity:

Before driving through Potter's Marsh, the group leader will give a brief historical background of the Potter's Marsh area with specific details concerning campsite development. The children will then spend approximately an hour observing and filling out an activity sheet. Children will note changes in environment caused by the development of the campsite and its related activities.

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Following lunch at the ECO-Center students will be divided into discussion groups. In the groups students will explain, justify, and summarize their assessment of the effects the development of the public use area has had on Potter's Marsh and the community of Thomson.

Evaluation:

Completion of the impact study sheet, and observation of student participation in group discussion.

Specific Objectives:

Riverview

Students will demonstrate their ability to identify:

a. reasons for people settling in the area
b. some of the problems arising from lack of zoning and city government, by completing the Riverview Activity Sheet

Learning Activity:

After leaving the ECO-Center the group leader will explain the activity sheet that is to be filled out as the bus drives through the Riverview area. The bus will stop at the Big Slough Public Use Area for discussion of the sheet.

Evaluation:

Check of completed work sheet.

Specific Objectives:

Spring Lake Wildlife Refuge

Students, after completing the tour of the wildlife refuge, will be able to:

a. identify two waterfowl management techniques
b. identify at least two reasons why man must now manage wildlife

Learning Activity:

With the cooperation of the Refuge manager, the bus will tour the 700 acre managed refuge. Frequent stops will be made to observe the migratory waterfowl. Children will learn to use field glasses and estimate numbers of waterfowl. Pupils also can observe areas of beaver activity. A walk along the shore of the dike gives the children a chance to observe other wildlife signs and to observe aquatic plant life. Here they will observe evidence of river pollution. During the trip around the wildlife refuge students will observe several management techniques. See the Spring Lake data sheet for more information on the refuge. On page 48.

Evaluation:

Teacher Observation.

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POTTER'S MARSH IMPACT STUDY SHEET
(For Students)

History of Potter's Marsh

The area known as Potter's Marsh was originally owned by the Potter family and consisted of farmland, woods, sloughs, and islands. Before Lock and Dam #13 was built the Federal Government bought the land. As much of the land and the islands were to be flooded, an attempt was made to clear the timbered areas. Much of the cutting was done in the winter, so trees were cut above the snow leaving tall stumps. The stump fields in the river are the result. The stumps slow down boats to prevent shore erosion.

When water backed up behind the dam, much of the farmland was flooded, islands were covered, and new sloughs and swamps were formed where the water backed into the lowlands. People were forced to leave land that was being flooded.

After the 1965 flood, the Army Corps of Engineers made part of the forest into a public use area for campers, fishermen, hunters, and boaters. To do this many changes were made.

Today you are asked to fill out sheets dealing with the changes necessary to make a campsite and their effect on the environment.

I. List five (5) things that had to be done before this area could be a usable campsite.
   A.
   B.
   C.
   D.
   E.

II. Fill the following blanks and be able to explain why you answered as you did. How did the changes you listed affect?
   A. Wildlife: Good___ Bad___ Both good and bad___ No effect___
   B. Hunting: Good___ Bad___ Both good and bad___ No effect___
   C. Fishing: Good___ Bad___ Both good and bad___ No effect___
   D. Boating: Good___ Bad___ Both good and bad___ No effect___

III. Now that the area is being used by the public, this may or may not have an effect on the town of Thomson. How may the following have been affected?
   A. Paved roads: Good___ Bad___ Both good and bad___ No effect___
   B. Resident of Thomson: Good___ Bad___ Both good and bad___ No effect___
   C. Businesses: Good___ Bad___ Both good and bad___ No effect___

IV. Write a short answer to each question listed below.
   A. What is good about this camping area?
   B. What is bad about the area?

Discussion

The class will be divided into groups each with an adult leader as moderator. You are to explain and summarize the answers you made on your sheets.

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RIVERVIEW ACTIVITY SHEET

Riverview is a settlemrnt along the Mississippi River. The settlement started as a resort area with summer cottages. Today there are many types of homes. There is no city government in Riverview. As the bus drives through Riverview, you are asked to answer the questions below.

I. List four (4) reasons why people might choose to build homes in the Riverview area.

a. _____

b. _____

c. _____

d. _____

II. List 3 kinds of housing in the area.

a. _____

b. _____

c. _____

III. List 5 problems caused by lack of zoning* and a city government.

a. _____

b. _____

c. _____

d. _____

e. _____

IV. How do people dispose of their sewage?

V. Who maintains the roads?

VI. Who enforces the laws?

* Zoning means having laws that control what may be built in certain areas.

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SPRING LAKE - PAST AND PRESENT

The 3,500 acre Spring Lake area was diked and ditched for farming in the years immediately following World War I. Corn and wild hay were the primary crops raised on the area. Several of the islands still show remnants of the buildings and farmsteads constructed in the past.

As it would be flooded, this land was purchased by the federal government prior to the installation of the lock and dams in 1938-1939. Seepage and springs gradually filled the area, and by 1946 a 3,000 acre lake had formed which averaged three to four feet deep. High black bullhead populations in the lake resulted in excellent fishing until the flood of 1965 broke the old dike that bordered the area.

After the dike broke, the inner lake fluctuated directly with the Mississippi River levels. This continual fluctuation severely impeded the growth of aquatic plants which provided food and cover for fish and food for migratory waterfowl.

As the entire area was set aside as a waterfowl sanctuary (Spring Lake is closed to all trespass from October 1 through the end of the duck season) something had to be done to regain control of the water levels. The cost to repair and maintain the entire outer dike was prohibitive so the Bureau of Sport Fisheries and Wildlife constructed the sand cross-dike in 1967-68. This dike separated a 700-acre from the lower lake and enabled the Bureau to regain control of water levels in a portion of the unit.

The upper area is now managed for maximum waterfowl use through the drawdown concept. The area is dewatered by pumping during the late spring and early summer period. This exposes the bottom and encourages growth of moist-soil plants (wild millet, smartweeds, sedges and various grasses) all of which produce seeds that are highly attractive waterfowl foods. Sometimes disking is necessary to aerate the soil and allow dormant seeds to germinate. Although normally an abundance of natural seed is already in the soil, often it is necessary to plant other waterfowl foods, such as millet, in the pool bottom. After the plants have attained their growth, water is brought back into the unit to flood the vegetation and make it available to the birds.

During the winter months, the water is again released from the unit to eliminate ice damage to dikes and to reduce rough fish populations.

The following table shows peak waterfowl numbers recorded on Spring Lake in the past four years. The first drawdown was conducted in 1969.

Species	1967	1968	1969	1970	1971	1972
Mallard	7,000	13,000	13,000	13,490	27,000	15,000
Lesser scaup	6,000	7,000	5,000	16,430	20,000	30,000
Pintail	300	500	500	2,500	1,470	1,750
Other divers	1,000	1,200	1,000	640	1,950	1,450
Other dabblers	1,000	2,000	1,500	2,000	7,600	2,300
TOTAL DUCKS	15,300	23,700	21,000	35,060	58,020	50,500
Canada geese	300	300	400	490	850	500
Blue & snow geese	230	200	3,000	600	1,000	550
total geese	530	500	3,400	1,090	1,850	1,050

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MAN AND THE RIVER TEST

MULTIPLE CHOICE - Place the letter of the best answer in the blank.

1. The purpose of the Lock and Dam #13 is _____

   A. to stop flooding.
   B. to make good fishing areas.
   C. to provide jobs for the unemployed.
   D. to aid in shipping on the river.

2. Lock and dam systems are used to _____

   A. control floods.
   B. maintain a deeper channel for boats.
   C. produce electricity.
   D. cross the Mississippi River

3. When the lock and dam system was built and put into operation what happened? _____

   A. no change in the environment
   B. much land flooded
   C. fishing was not changed
   D. all lands went to waste

4. When a community is zoned it _____

   A. has rules on the type of building that can be built in the town.
   B. gets help from the federal government.
   C. has a fire department.
   D. has free water and sewer systems.

5. A problem that might arise from lack of zoning is _____

   A. no streets.
   B. no mail delivery.
   C. no water.
   D. no rules on construction in the community.

6. A wildlife refuge is _____

   A. a commercial fishing area
   B. a place for wildlife to be safe.
   C. a zoo.
   D. an open hunting grounds.

7. The lock and dam system and the wildlife refuges are under the direction of _____

   A. the federal government.
   B. the state government.
   C. the Izaak Walton League.
   D. the county government.

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MAN AND THE RIVER TEST

8. One waterfowl management technique used in the impoundment program is _____

A. drawn down of water.
B. cut down all plants.
C. keep all but ducks out.
D. keep water out of the area.

9-12. The Mississippi River has played an important part in the history of the United States. Circle the numbers of the correct statements that describe a part of the role the river has played.

1. Trading routes with the Indians.
2. Was first explored by Lewis and Clark.
3. Was used in the shipping of lead ore to the European markets.
4. Opened the West to settlers.
5. Was part of an all-water route to the Pacific.
6. Carried produce to Eastern markets.

FILL IN THE BLANKS

A. List 3 things that are most often shipped on the Upper Mississippi River.

13. _____

14. _____

15. _____

B. What changes had to be made to develop Potter's Marsh into a Public Use Area? List 3.

16. _____

17. _____

18. _____

C. List 2 reasons why people settled in the Riverview area.

19. _____

20. _____

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FOLLOW-UP ACTIVITIES

The following activities have been developed by fifth grade teachers as samples of activities that could be used following the Man and the River field trip. Activities have been developed for each discipline.

ACTIVITY: Developing a newspaper article about the field trip.

DISCIPLINE AREA: English (Language Arts)

PURPOSE: To organize a news article about the Man and the River field trip.

OBJECTIVES:

1. The student will be able to describe their experiences.
2. The student will incorporate adjectives and adverbs in their writing.
3. The student will be able to organize experiences into a paragraph.
4. Students will develop new vocabulary terms.

LEARNING ACTIVITY:

1. Classroom teacher will present several well-formed newspaper articles.
2. Using the articles, the teacher will point out the sequence, examples of adjectives and adverbs used to describe the topic.
3. Students will write an article for a newspaper about their field trip.

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ACTIVITY: Learning Station

DISCIPLINE AREA: Reading

PURPOSE: To enrich Man and the River field trip learnings and encourage reading. To solidify interest in environment and stimulate interest in social change.

OBJECTIVES:

1. The student will be able to choose materials to read in his interest area.
2. The student will be able to find answers to questions that remain unanswered from the field trip.
3. The student will be stimulated to develop an interest in environmental preservation.

LEARNING ACTIVITY:

1. Set aside an area in the room in which materials (books, filmstrips, maps, pamphlets) have been placed. Have available equipment.

   Some Suggestions:

   Ducks at a Distance
   National Wildlife
   Ranger Rick
   Nest Houses for Wood Ducks-Dept. of Conservation
   Upper Mississippi River Corps of Engineers
   What Fish Is That? - Illinois Dept. of Conservation
   Forest Trees of Illinois

2. Some students may be stimulated to environmental action. This should be encouraged. A manual activity might be building bird houses. See classroom instruction page ___ for direction. Other action activities include recycling projects.

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ACTIVITY: Bird Feeders

DISCIPLINE AREA: Science
s

PURPOSE: To extend from the wildlife refuge to the school environment the concept of protecting birds by managing the environment.

OBJECTIVES:

1. The student will construct a simple bird feeder.
2. The student will collect appropriate seeds for the feeder.
3. The student will learn to identify birds visiting the feeder.

LEARNING ACTIVITY:

1. Classroom teacher will provide reference material such as, "Birds" by MacBean, Stecher, etc.
   "Audubon Guide to Attracting Birds" and
   available materials from school library.
   Dec.-Jan. 1973 National Wildlife Magazine.
   See pages107-111 for building feeders.
2. Arrange class into small groups to enhance the learning situation.

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ACTIVITY: Story Problems

DISCIPLINE AREA: Math

PURPOSE: To incorporate addition, subtraction, multiplication and division in story problems related to concrete experiences.

OBJECTIVES:

1. The student will demonstrate his ability to solve story problems involving addition, subtraction, multiplication and division.

LEARNING ACTIVITY:

1. The teacher will prepare a worksheet containing problems involving situations experienced on the field trip. Problems may involve weights of cargo, numbers of birds, mileage, averages.

   Story Problems:

   1. How many tons of cargo are carried by a 9 barge tow if each barge carries 1,500 tons? _____
   2. How many pounds would this be? _____
      (1 ton = 2,000 pounds)
   3. If there were 2,591 snow geese in the wildlife refuge on Wednesday and only 1,657 are there on Thursday, how many snow geese have flown south for the winter? _____
   4. If there are 43 stumps in the stump field at Potter's Marsh, and 6 blue gills can live around each stump, how many blue gills would be in the area? _____
   5. If a snow goose flies approximately 45 miles per hour, how far can he fly in 7 hours? _____
      How many hours would it take him to fly 180 miles? _____
   6. Using the following chart, tell what the average number of birds in the wildlife refuge would be for 1 day.

Mon.	2,654
Tues.	5,203
Wed.	1,568
Thurs.	939
Fri.	1,004
Sat.	6,542
Sun.	3,450

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MAN AND THE RIVER

FOLLOW-UP ACTIVITY

ACTIVITY: Study the effects of the Mississippi River on the local community.

DISCIPLINE AREA: Social Studies

PURPOSE: To better enable the student to realize the importance the Mississippi River has on area communities and on the student personally.

OBJECTIVES:

1. The student will list at least two examples of how the river affects the community and his family.

2. The student will demonstrate his increased awareness of the influence the river has on the local environment by identifying an interest in, and participating in, interest groups studying the river's effect.

3. The student will develop a meaningful relationship between his community and himself.

LEARNING ACTIVITY:

1. The classroom teacher will survey interests and then divide the class into the following interest groups on the Mississippi River:

   a. products connected with the river
   b. recreation
   c. wildlife
   d. job opportunities
   e. effects of floods

2. The student groups will then compile examples of how each of these affect their local community and report back to the class.

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FIELD EXPERIENCE III

MAN AND THE ELEMENTS

CAMP BENSON

MT. CARROLL, ILLINOIS

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FIELD EXPERIENCE III

MAN AND THE ELEMENTS

Place: Camp Benson, Mt. Carroll

Purpose: To study the forces of change in this unique geological area.

Transportation: A bus will be needed to and from. See appendix for bus trip activities.

Material and Equipment: All material and equipment supplied by the ECO-Center

Children will need a sack lunch or other food to cook. If the class is going to bake apples, each child will need an apple.

Proper Dress: This experience takes place in late March and early April. Children should dress warmly as the weather is likely to be unstable. Each child should have boots, gloves, and a covering for the head. There is a lodge to get in out of the weather.

Assistance: An ECO-Center staff member will assist the teacher on the field trip.

Cancellation: The weather at this time of the year can be unstable. To reschedule a date call the Center (259-3282) after 8:00 AM or the director before this time.

Pre-Trip Planning: Follow tips under Planning and Conducting Field Trips. It is possible to do some outdoor cooking if desired.

The Camp Benson area has many geological features which are unique to this area and a study of these features is a major part of this experience. A lesson has been developed for presentation, dealing with the geological history of this area. The filmstrip from Rock to Forest would also be an excellent pre-trip study.

CLASSROOM PRESENTATION

Purpose: To acquaint the student with the area prior to the experience.

Camp Benson is owned by the Sterling YMCA and is used as a summer camp. The area was owned for many years by Ben Smith and was run as a private park. The main attraction was a cave, part natural and part drilled by lead prospectors. This cave was reached by crossing a suspension bridge, and was lighted by a private electric system.

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The cave is still there but is not accessible because of the deep water at its mouth. The bridge has been gone for years. We will not be able to go into the cave.

During the depression of the 1930's, attendance fell off when eople had no money and the government established free parks. The area was then used as a CCC camp for inner-city unemployed boys. The remains of some of the old installations are still there. The property was then bought and the purchaser started to build, but for some reason the building was not completed until the YMCA bought it and finished the building as a lodge. The only other buildings are bunk houses.

This area is unique, that is, very unusual, for this part of the country. It is at the edge of a region known as the driftless area, land that was never covered by glaciers. The uniqueness is a product of a long history of changes in the earth's surface.

The earth is made of rock. There are three classes of these rocks, igneous, sedimentary, and metamorphic. All rocks were originally igneous. This rock is volcanic and was once molten. After it hardened, weather began to work on it. Winds and water, freezing and thawing, gradually broke it down and carried it away and deposited it somewhere else.

This part of the United States was covered with shallow seas. The streams carried the broken-up igneous rock into the seas and filled them in. Sometimes the land would rise and the bottom would be dry land. Erosion would start immediately. Then the land would sink again, the seas would come in, and the streams would deposit another layer of silt. The shallow seas remained for a long period of time. Eventually many layers of silt were laid down on the bottom of the shallow seas. The weight of the layers on top would pa pack the ones below into rock. The newly formed land tilted and folded, changes taking place within the earth and these showed up as changes in the layers of rocks.

How do we know that the rocks were once in the sea? We can tell by the fossils. These are of sea animals much like those found in shallow seas today.

If the rocks have enough pressure and heat they are changed again to metamorphic rocks.

(Show transparencies #2 of rock layers.) Transparencies follow Page 61.

This went on for millions of years until the layers of sedimentary rock were thousands of feet thick. It has been more millions of years since the last time the sea covered this area. In the Camp Benson area the top rock layers have been worn away to the Galena dolomite. This is a very thick layer which can be seen in the deep canyons of the park. It is identified by a fossil, the receptaculites, which we will see when we go on this field trip.

After these millions of years the climate changed. (Show transparency #3 of North America). For thousands of years snow fell and

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piled up until it turned to ice. Still it snowed and the weight became greater. Finally the ice began to move. This moving ice is called a glacier. There were two great centers of glaciers both in Canada, one east and one west of what is now Hudson Bay. The ice moved very slowly, often only a few feet a year, but it covered everything in its path. Boulders, sand, and gravel were frozen into the layer of the glaciers and this acted as sandpaper, leveling off the hills, filling valleys, scraping the rocky ledges clean.

Slowly the glaciers moved south. (Show transparency #4, fig. 5 and 6). Four times the glaciers moved south and then melted back. The first glacier, the Nebraskan, sent a tongue of ice over what are now Minnesota and Iowa south to northern Missouri. It covered parts of Wisconsin, Illinois, North and South Dakota and Nebraska. For some reason there was an area (shown in dots) that was untouched. The next, or Kansan, glacier covered much of the middle west but again missed the small area shown in dots. The third (transparency #5, Fig. 7 and 8), Illinoian, reached almost to the southern tip of Illinois but missed the same area. The last, or Wisconsin, again missed the same spot.

This unglaciated region is known as "the driftless area". While the land all around it was leveled off to rolling hills and gentle valleys this was left with steep hills and deep valleys. When the last glacier melted great rivers were formed, and these rushed through the driftless area cutting the valleys deeper and leaving deposits of rocks and grave. While the glaciers scraped away the plants of the land it covered, these same plants lived on in the driftless area. Today we find plants here that are not found anywhere in the area covered by glaciers. We shall identify a few of these plants.

(Profile transparency #6)

This transparency shows how the Galena dolomite is folded so that it tilts up in the Camp Benson area. Notice how the top layers have been eroded away so the dolomite is exposed in the canyons.

(Transparency #7 of Camp Benson)

Here we see how the Waukarausa River has cut a deep, crooked canyon through the park. The normal way for the river to have drained was to the south, but it is believed that a huge ice dam blocked the way. The river had to cut a channel through the rocks and drain west to Plum River.

In this camp we will study the rock formations and possibly find a few fossils. We will see some plants and trees that are uncommon and usually found further north. We will learn to use a compass to find our way in the woods, and we will learn to make field measurements. We will see evidence of many kinds of wild animals which live here. Some of you may find fossils which have been carried in by streams. The transparencies #8 & #9 will show you the kinds of fossils most commonly found. Receptaculities is a fossil generally only found in Galena dolomite.

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CLASSROOM VISIT BEFORE CAMP BENSON TRIP

I. Classes of rocks

A. Igneous
1. Basic earth-making materials
2. Molten origin

B. Sedimentary
1. Broken down igneous rocks
2. Redeposited
3. a. wind
b. water

C. Metamorphic
1. Either igneous or sedimentary
2. Changed by heat and pressure

II. Sedimentary Deposits

A. Material carried by streams during times of great rains

B. Laid down in shallow seas
1. Identified by fossils, similiar to sea animals found today
2. Laid down in layers

C. Layers due to rise and fall of land
1. Erosion during times land above sea
2. Uneven erosion
3. Land often buckled causing layers to fold or break

D. Millions of years to form sedimentary layers

E. Harden into rock because of weight and pressure

III. Period above seas

A. Surface eroded

B. Rivers cut valleys

IV. Glacial period

A. Climate change
1. Cold
2. Endless snow
3. Never melting

B. Glaciers formed
1. Thousands of feet of snow
2. Weight caused ice to form
3. Weight caused ice to move

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C. Extent of glaciers
   1. Two centers
   2. Covered most of Canada
   3. Covered some of the United States
      a. New England
      b. Great Lakes area
      c. Northern North Dakota, through Minnesota, part of Nebraska, Kansas, Iowa, and Illinois
      d. Farthest souther reach to southern Illinois
   4. Driftless

D. Effect of glaciers
   1. In areas of shallow soil over rocks stripped land clean
   2. Filled valleys
   3. Leveled hills
   4. Melting left dirt, sand, gravel and rocks
   5. Streams cut new river channels

E. The "Driftless Area"
   1. Not leveled
   2. Great rivers flowing through eroded soil from tops of hills and cut deep valleys
   3. Remnants of plant life of pre-glacial ages remain

F. Camp Benson area
   1. Ice jam caused water to flow west and north rather than south
   2. Cut irregular valley because of lesser resistance of rock

V. Things to observe at Camp Benson
   A. Course of stream
   B. Erosion pattern
      1. In fields
      2. In rock
   C. Rock layers
      1. Softer under harder
      2. Top erosion
   D. Factors of erosion
      1. Rainfall
      2. Frost
      3. Plants
   E. Plant succession
      1. Lichens and mosses
      2. Small plants
      3. Shrubs
      4. Trees
   F. Forest
      1. Basic oak
      2. Mixed hard and soft woods
      3. Difference between bottom land and bluffs
   G. Other things at Benson
      1. Wild flowers
      2. Moss
      3. Animal signs
      4. Birds
      5. Evidence of man

Transparency #2

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SYSTEM	SERIES	GROUP, STAGE	FORMATION, UNIT	COLUMN	THICKNESS (feet)	DESCRIPTION
QUATERNARY		Recent				Alluvium, dune sand
	Pleistocene	Wisconsinan	Peoria		0-15	Loess, tan
			Farmdale		0-3	Silt, peaty
			Roxana		0-5	Loess, pinkish tan
		Illinoian			0-15	Till, yellow brown
SILURIAN	Niagaran		Racine		0-80	Outwash, sand, gravel, silt
					80	Dolomite, pure, massive to thin-bedded
			Waukesha		50	Dolomite, pure, massive
			Joliet		45-50	Dolomite, thin-bedded, some chert
	Alexandrian		Kankakee		30	Dolomite, argillaceous, cherty
			Edgewood		5-90	Dolomite, argillaceous, thin shale beds at bottom
		Maquoketa			90-200	Shale, green; some limestone beds; phosphate nodules at base
ORDOVICIAN	Cincinnatian		Dubuque		25	Dolomite, argillaceous
			Wise Lake		75	Dolomite, pure, massive; Receptaculites in upper half
		Galena	Dunleith		130	Dolomite, very cherty, abundant Receptaculites in zones; shaly, thin-bedd at bottom
			Guttenberg		8	Dolomite, red shale beds
	Champlainian	Platteville			75-110	Dolomite, limestone, argillaceous, cherty
		Ancell	Glenwood		2-55	Sandstone, shale, dolomite
			St. Peter		50-300	Sandstone, pure, massive; shaly at bottom
CANADIAN (LOWER ORDOVICIAN) AND CROIXAN (UPPER CAMBRIAN) STRATA (undifferentiated)					1250	Limestone, dolomite, sandstone, shale
PRECAMBRIAN						Granite; other igneous and metamorphic rocks

Fig. 2 - Generalized sequence of strata in the Mt. Carroll area.

EXTENT OF NORTH AMERICA GLACIERS

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Transparency #3

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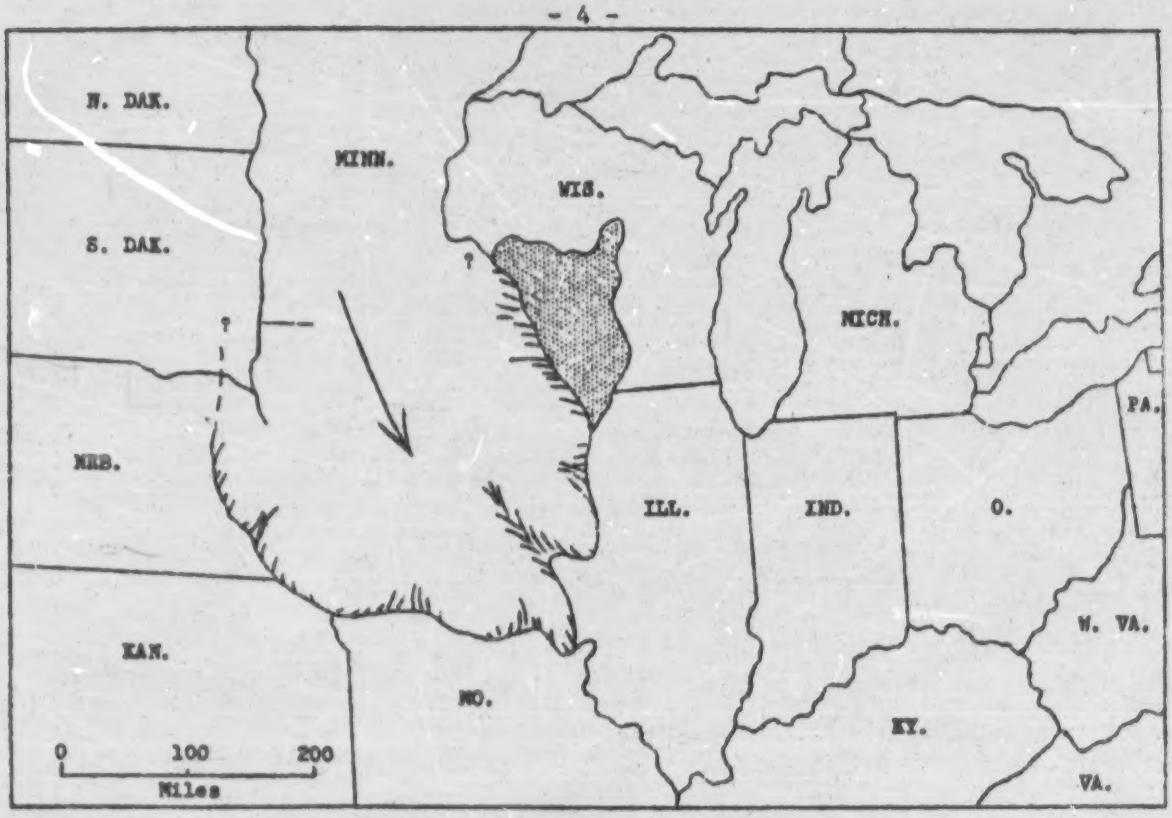

Fig. 5 - Maximum extent of Nebraskan glaciation (1,000,000 years ago). Driftless Area shown by stippled pattern. Arrow indicates direction of ice movement.

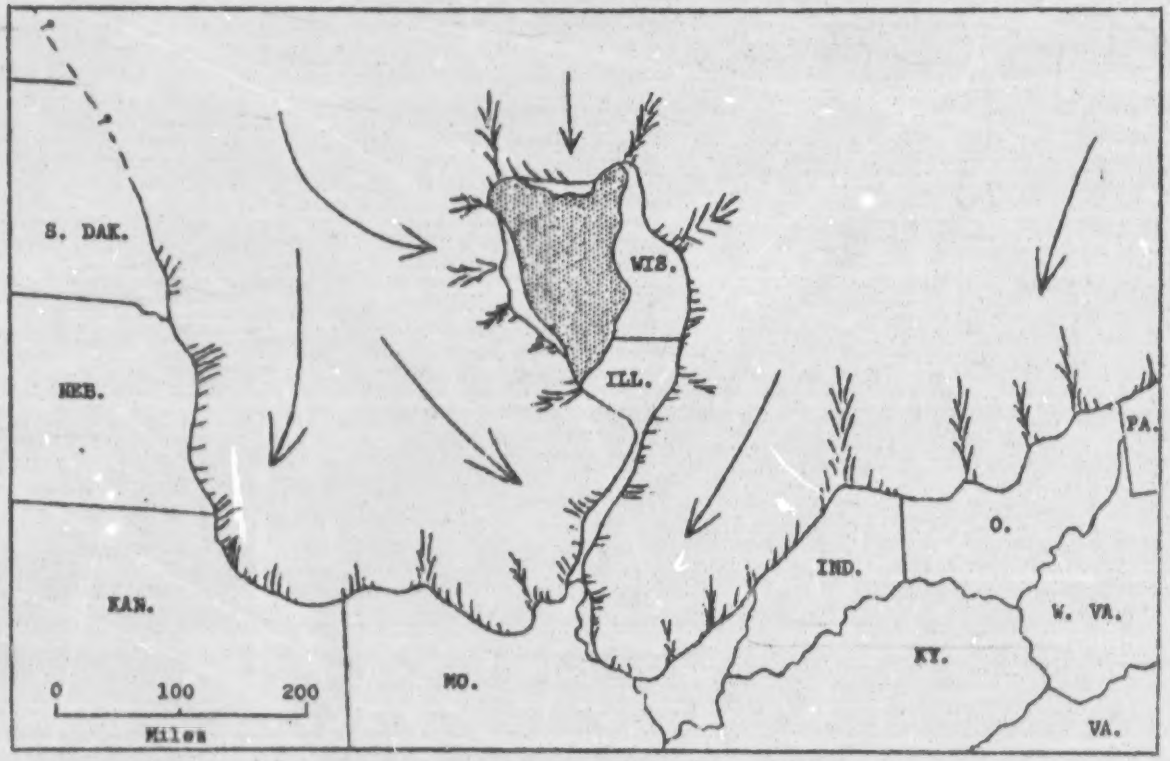

Fig. 6 - Maximum extent of Kansan glaciation (700,000 years ago).

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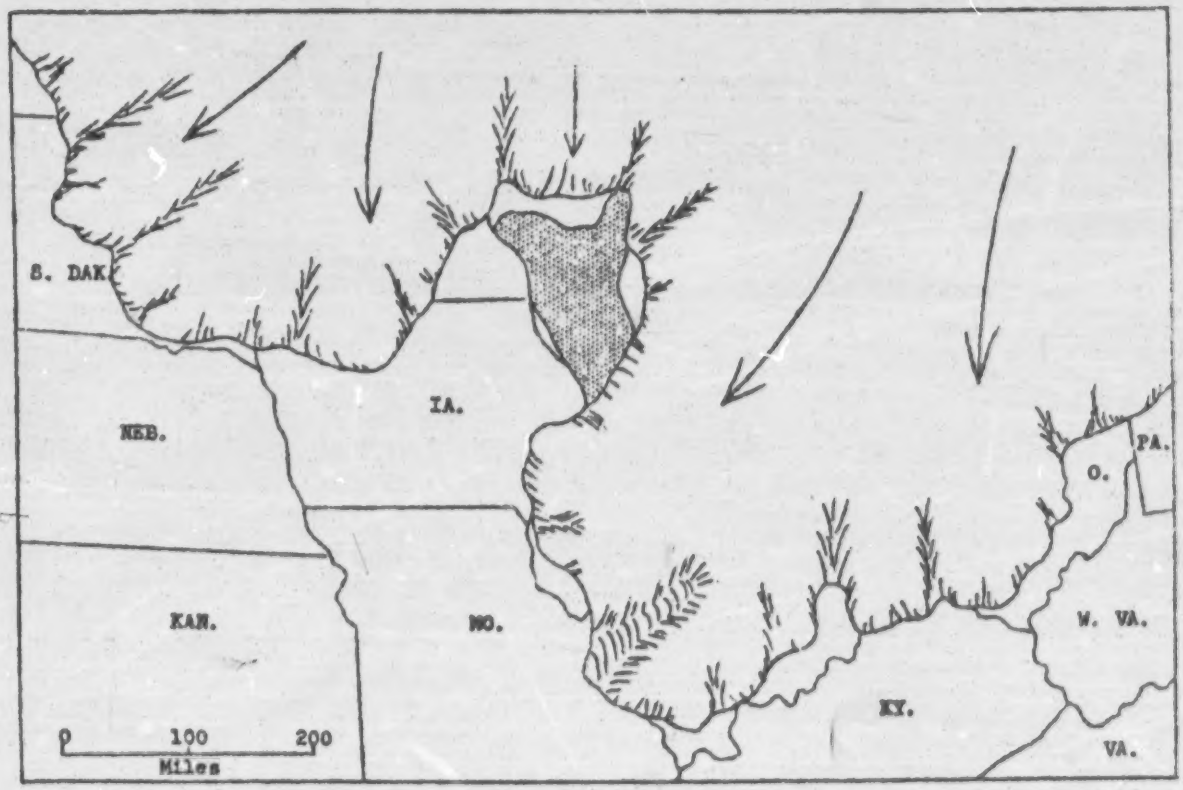

Fig. 7 - Maximum extent of Illinoian glaciation (250,000 years ago).

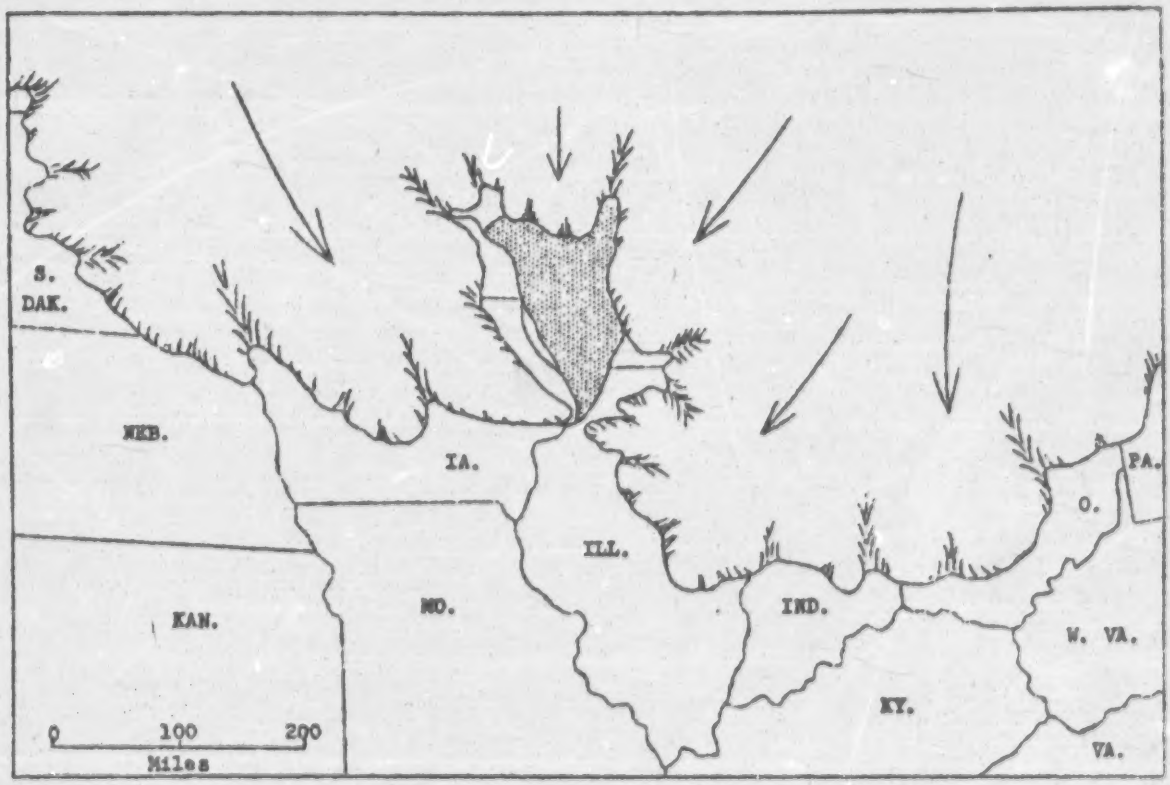

Fig. 8 - Maximum extent of late Wisconsinan glaciation (20,000 years ago).

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PREGLACIAL EROSIONAL HISTORY OF THE MT. CARROLL AREA

The topography of the field trip area has had a long history of development. Since the last Paleozoic sea withdrew at the end of the Pennsylvanian Period about 270 million years ago, the Upper Mississippi Valley region has remained a land area. During this long erosion interval many hundreds of feet of Paleozoic strata have been stripped away. During the Pliocene Epoch between 11 and 1 million years ago, near the end of the Tertiary Period, the region was reduced to an erosional plain of very low relief known as the Dodgeville Peneplain.

A peneplain is a land surface that has been worn down by stream erosion and mass wasting to a low, nearly featureless plain that gradually slopes upward from the sea. Such an erosion surface would require a very long time to develop and would be characterized by sluggish streams flowing in broad valleys. Bedrock structures, such as anticlines, would have no influence on the topography but would be uniformly beveled.

After the Dodgeville Peneplain was formed, the region was uplifted and another partial peneplain called the Lancaster Peneplain was eroded on the bedrock at a lower level. In the Driftless Area of Wisconsin, the Dodgeville surface is well preserved. In Illinois only remnants of the Dodgeville Peneplain are preserve in Jo Daviess County as isolated, flat-topped ridges and knobs of Silurian dolomite (fig. 12). When the tops of these Silurian flats are joined by an imaginary plane, a surface representing the former peneplain is formed that slopes gently southwestward from about 1150 to 1000 feet above sea level.

The Lancaster Peneplain, which occurs about 200 feet lower than the Dodgeville Peneplain, is extensively preserved on the bedrock surface of northern Illinois. It is well developed in the Driftless Area, and east of the Driftless Area it is a gently undulating surface covered by the glacial deposits. It closel coincides with the top of the Galena Dolomite and slopes southwestward from about 950 to 800 feet above sea level. The Mt. Carroll area is at the southern edge of the Lancaster Peneplain. The peneplain bevels the bedrock structure on the Savann Anticline, so that the surface occurs on the Galena Dolomite, the Maquoketa Shale, and the Silurian formations (fig. 12). The surface slopes southwestward from about 925 to 850 feet at about 3 feet per mile in the Mt. Carroll Quadrangle. The Lancaster surface is evident by the evenness of the horizon toward the west, north

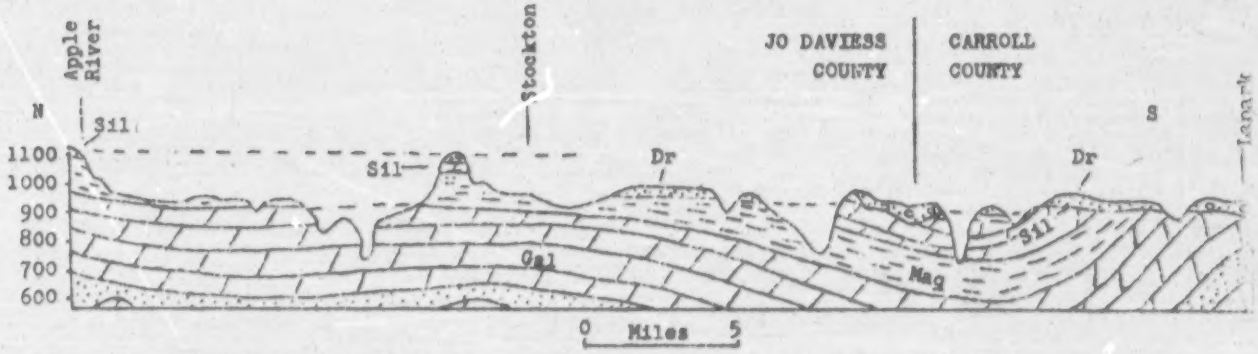

Fig. 12 - Cross-section showing Dodgeville (upper) and Lancaster (lower) erosion surfaces in northwestern Illinois and relationships to bedrock structure. Line of section is from Apple River to Stockton to Lanark. Dr, Glacial drift; Sil, Silurian dolomite; Maq, Maquoketa Shale; Gal, Galena Dolomite.

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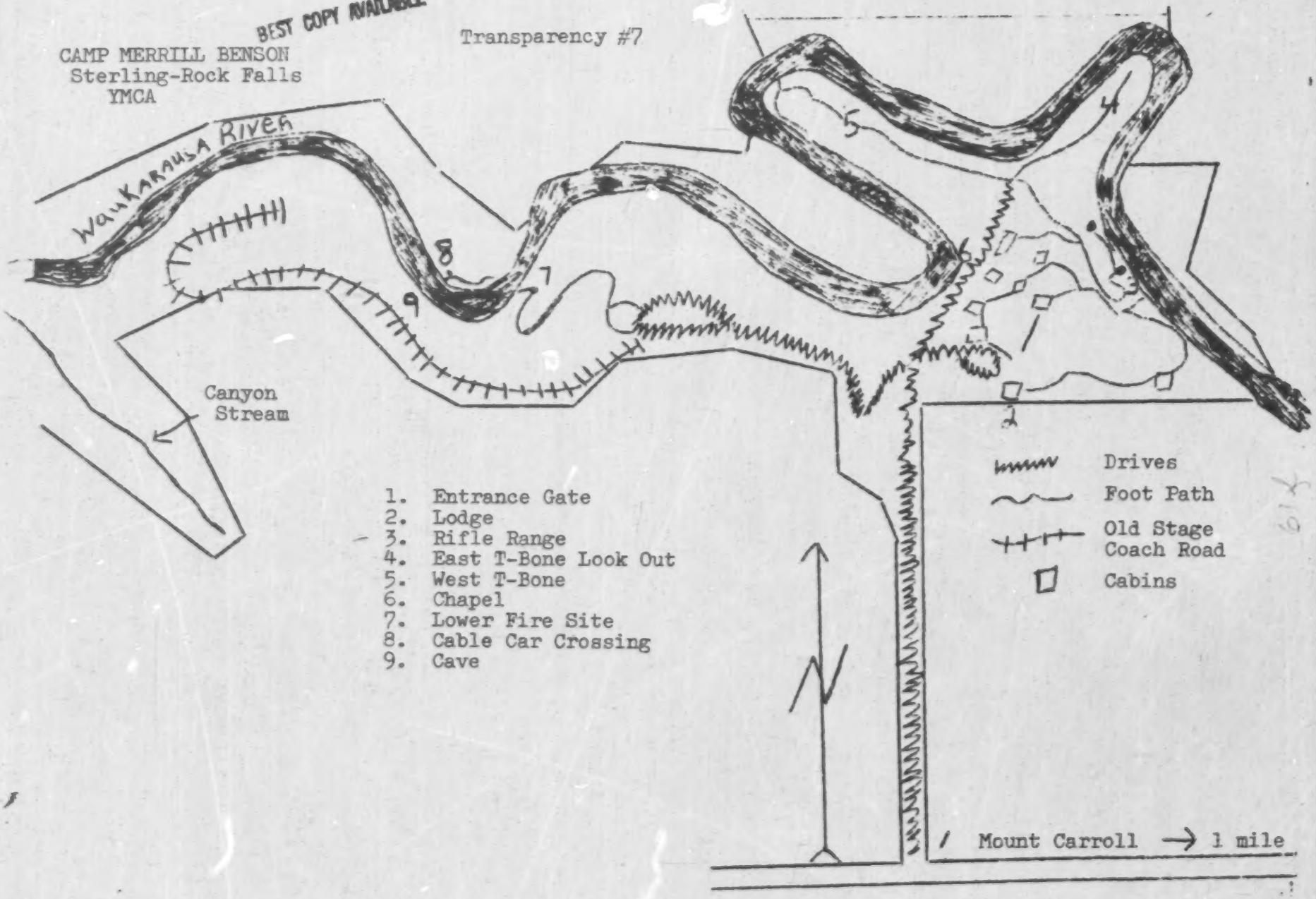
Transparency #7

CAMP MERRILL BENSON
Sterling-Rock Falls
YMCA



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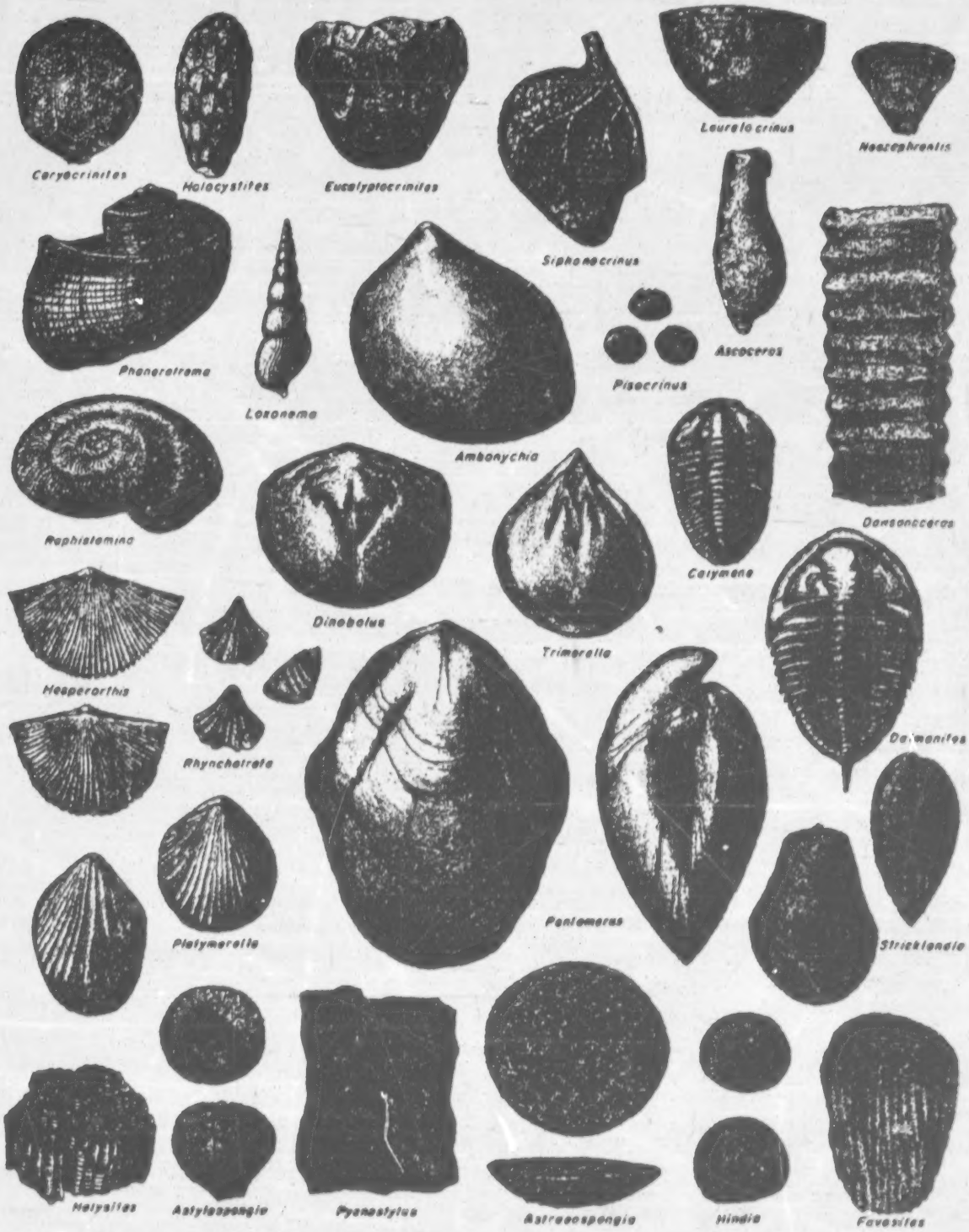
REPRESENTATIVE SILURIAN FOSSILS FROM NORTHWESTERN ILLINOIS



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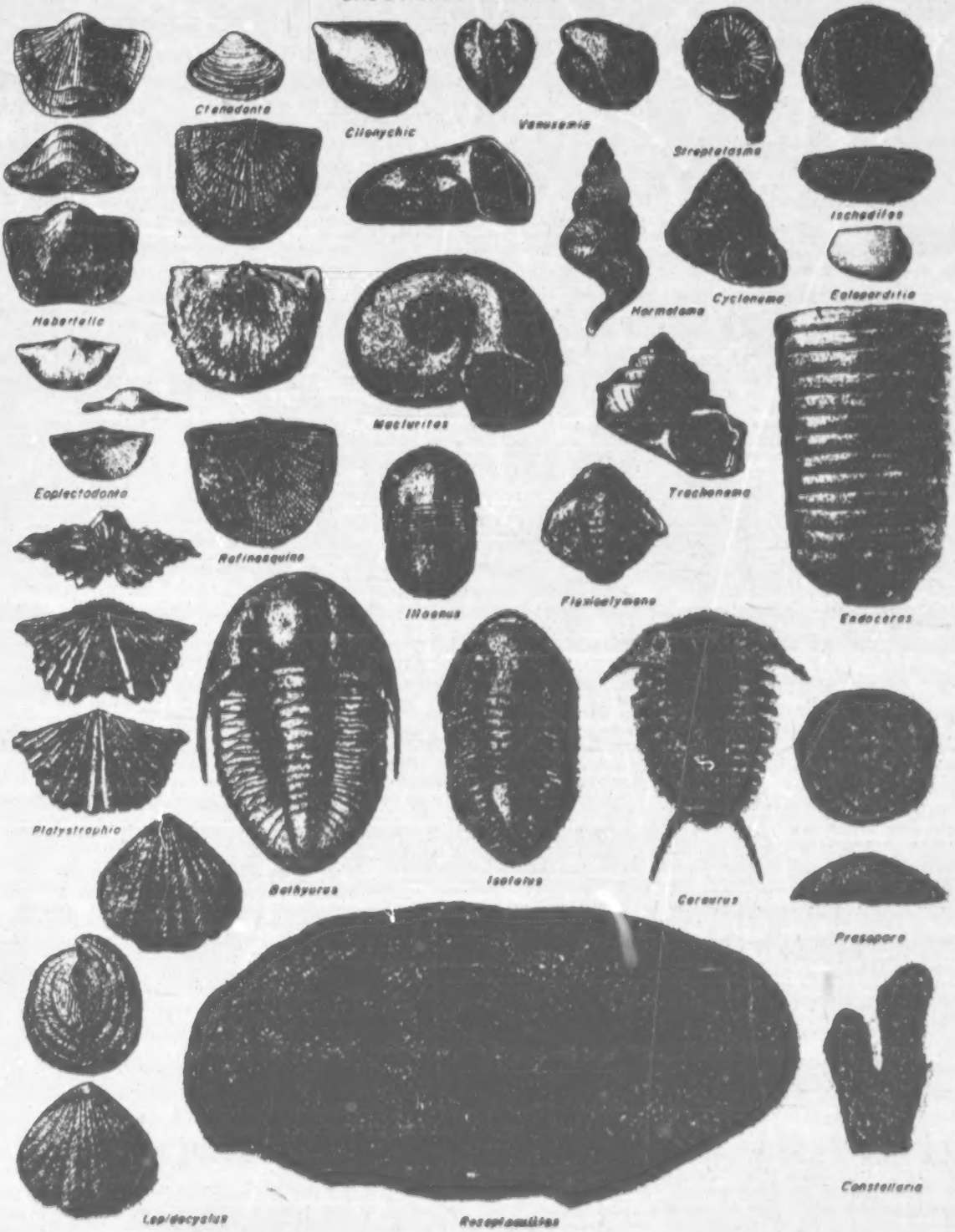
ORDOVICIAN FOSSILS



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Schedule: Field Experience III

A. M. - Compass Study
Geology Hike
Area Awareness Study

Noon - Outdoor Cooking

P. M. - Succession, Forces of Nature
Personal discovery

Behavioral Objectives: Field Experience III

Given a one day field experience at Camp Benson, fifth grade students will increase their knowledge in the following areas:

Compass skills

The student will demonstrate his ability to use a compass by participating in a game of headings and by following a compass trail.

Geology

The student will be able to:

a. identify sedimentary rock layers and Galena dolomite
b. identify three forces of nature that wear away rocks
c. identify the steps of bare rock succession (rock, lichen moss, plants, trees)

Awareness

The student should be able to

a. give at least three reasons for preserving an area such as Camp Benson
b. identify three examples of man's abuse of the Benson environment

Plants-animals

Students will

a. find and identify two animal tracks
b. come up with two reasons for rare plants being in the area
c. find and identify two wildflowers
d. be able to identify animal homes

Outdoor living skill

Students will cook on an outdoor fire.

Learning Activity:

A. The class will meet in the lodge where staff members will explain the day's activities, give a history of Benson, and set rules for the day.

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B. Compass and pacing--The first activity deals with the compass. The class is taught how to determine reading on a silva compass, and then plays a game of headings where a leader shouts out a direction and children using compasses orient themselves to that direction. Children are then taught pacing. A 100' interval is marked off with the children to pace this and then determine the approximate distance of the pace.

These skills are then used the rest of the morning as the children are to follow a compass trail to arrive at various stations. Besides taking compass readings of creek flow at various stations, the the following will be studied on the trail:

a. erosion patterns
b. geological features
c. recognition of rare plant life and the reasons for it
d. observation of wildflower growth
e. comparison of plant life on rock bluffs to river valley
f. man's effect on the area including signs of litter and destruction

C. At noon, children can try some outdoor cooking over a wood fire. After some free time at lunch a quiz will be given in the lodge on morning activities. Also to be discussed are the economic conditions that saved this unique area and steps that need to be taken to further preserve the area.

D. In the afternoon, a scavenger hunt of litter will start activities. Then the stage coach trail is followed and another trail is followed to Carroll Creek. On the trail stops will be made to study:

1. Succession on bare rock as soil is being formed (lichen moss, plants, trees)
2. forces of nature that erode
3. plant life on the rocky bluff

At the creek, time will be spent looking for rocks and fossils. The class will then be divided into groups to discuss the value of preserving natural areas and what each person can do to preserve the earth's environment.

Evaluation:

Quiz over morning activities.

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FOLLOW-UP ACTIVITIES

The following activities have been developed by fifth grade teachers as samples of activities that could be used following the Camp Benson field trip. Activities have been developed for each discipline.

ACTIVITY: To write poetry using Camp Benson as source material

DISCIPLINE AREA: Language Arts

PURPOSE: To help students express themselves aesthetically.

OBJECTIVES: The student will be able to:

1. express his feelings about Camp Benson in words.
2. place these words into a designated pattern.

LEARNING ACTIVITY:

1. The teacher will select a desired pattern - some possible suggestions are couplets, triplets, limericks, haiku, and cinquain.
2. The student will compose a poem according to the directions given.

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CAMP BENSON

FOLLOW-UP ACTIVITY

ACTIVITY: Make sedimentary rock

DISCIPLINE AREA: Science

PURPOSE: To demonstrate the formation of sedimentary rock.

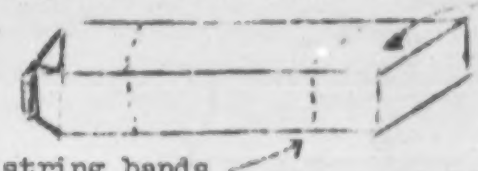
OBJECTIVES: The students will be able to:

1. tell how sedimentary rock has been formed in layers

LEARNING ACTIVITY:

1. The students will construct a model following this procedure:

   a. Using a half gallon carton, cut off a side - reinforce



   sides with string bands

   b. Fill container 1/2 full of H_2O

   c. Add approx. 1 cup of each of the following materials: allow each layer to dry overnight

      1. Sandstone (cement and sand) 1 part-6 parts
      2. Coquina (ko - ke ' na) (Shells - sand - cement)
      3. Gypsum (Plaster of Paris
      4. Conglomerate - Pudding Stone (Pebbles & sand-cement)
      5. Powdered Clay (feldspar)
      6. Powdered chalk (gypsum)

   d. When completely hard, peel away carton. Water will be gone.

   e. With a three-cornered file, you may cut a groove through several layers. Green sponge may be used for trees.

   f. You have made 2,000,000 years of history.

* Color may be added to layers if desired.

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CAMP BENSON

FOLLOW-UP ACTIVITY

ACTIVITY: Compass Treasure Hunt

DISCIPLINE AREA: Mathematics

PURPOSE: To extend and reinforce previous compass and pacing experiences.

OBJECTIVES: The student will be able to:

1. Accurately read a compass and effectively use the pacing technique.
2. Reach a designated point given specific instructions.

LEARNING ACTIVITY:

1. Teacher will prepare 2 designated courses, and provide compasses and "treasure".
2. Using their compasses, the students will follow the given instructions.

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ACTIVITY: A projection of the changes which would occur if Camp Benson were a housing development site.

DISCIPLINE AREA: Social Studies

PURPOSE: To emphasize the effect of land development on an irreplacable natural resource.

OBJECTIVES: The students will be able to:

1. identify changes in land use and the effects they would have on the Benson Eco-system.
2. list good effects and bad effects of land development on Camp Benson

LEARNING ACTIVITY:

After being divided into groups, students will fill out an impact sheet in order to present their views on land development at Camp Benson. Views of the entire class should be expressed.

IMPACT SHEET

If Camp Benson were developed into a housing development what would happen?

A. You are asked to identify things in the area that would be changed by the development.

Identify	What will be changed?
Wildlife	
1. _____	_____
2. _____	_____
3. _____	_____
Geology of the area	
1. _____	_____
2. _____	_____
Plants and Trees	
1. _____	_____
2. _____	_____
3. _____	_____
What people benefit now?	If changed who would benefit?
1. _____	_____
2. _____	_____

B. Why is Camp Benson such a "unique" area?

_____

_____

C. Assuming Camp Benson were changed into a housing development-- List three bad effects on the area, as well as three good effect on the back of your sheet.

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SEWAGE TREATMENT PLANTS

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ACTIVITY: Sewage Disposal Study

PURPOSE: To help the student understand one aspect of the ever-increasing problem of waste disposal

OBJECTIVE:

Given an one hour tour of the local sewage treatment plant, the students will demonstrate their understanding of the operation of the sewage plant by drawing a diagram of, and explaining the operation of, the local treatment plant. Students, after the study, will be able to identify the reasons for such plants.

TOUR OF LOCAL SEWAGE TREATMENT PLANTS

Tours of local sewage treatment plants can be easily arranged by contacting your local plant manager. Consult the Directory of Educational Resources for names and places to be contacted.

- - - - - - - -

INFORMATION EXPLAINED DURING TOUR OF AREA SEWAGE TREATMENT PLANTS

SEWAGE DISPOSAL

PRIMARY - REMOVAL OF SOLID WASTE
SECONDARY - PURIFYING WASTE WATER, USING BIOLOGICAL PROCESSES

PRIMARY I. Screen out solids

A. Go through screens varying from coarse to fine
B. May be ground fine.

II. Grit Chamber
A. Small particles settle to bottom, raw sludge
B. Usually disposed of by land fills.

III. Effluent (Water with dissolved and suspended particles) Chlorinated and returned to streams.

A. This process now considered inadequate.
B. Increased amounts of wastes need further treatment.

SECONDARY I. Secondary treatment removes up to 90% of organic matter in sewage.

A. Trickling filters
B. Activated sludge

II. Trickling filters

A. Sewage passes through bed of stones
1. Bacteria consumes most of organic matter.
2. Flows over stone bed or is sprayed over the bed.

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DEWAGE DISPOSAL (cont.)

B. Activated Sludge
   1. Sewage pumped into tanks, mixed with air and bacteria-laden sludge
   2. Remains for several hours while bacteria breaks down organic matter
   3. Flows to sedimentation tank
   4. Chlorinated

C. Advantages and disadvantages of activated sludge process.

   1. Costly
   2. Needs large oxygen supply
   3. a. May be piped from bottom of tank and sprayed into the air using oxygen from the air
      b. May have air forced into it by pipes.
      c. May use a combination of A and B.
   4. An effective process to reduce the amount of waste.

D. Chlorination
   1. Kills more than 99% of harmful bacteria.
   2. Liquid chlorine converts to gas for use.

SEWAGE TREATMENT FOR RURAL AREAS

I. Lagoons
   A. Ponds where sunlight, algae, and oxygen interact to purify water.
   B. Subject to weather influence

II. Septic Tanks
   A. Holding tank for solid sludge.
   B. Bacteria break down organic matter.
   C. Water flows out through series of drains.
   D. Care must be taken to prevent water from reaching drinking water supplies.
   E. Require regular maintenance

FURTHER TREATMENT NEEDED

I. Existing plants unable to purify sewage properly.
   A. Too many people
   B. Wastes from industry, chemicals, fertilizers and pesticides cannot be broken down by ordinary processes.

II. Many new methods being tried
   A. All costly
   B. None effective in all areas

III. Disposal of sludge
   A. Tried to burn
   B. Landfill
   C. Commercial fertilizer sold
   D. Used in public areas
   E. Used to restore waste areas such as strip mine area.

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PRIMARY TREATMENT

a. As sewage enters a plant for primary treatment, it flows through a screen. The screen removes large floating objects such as rags and sticks that may clog pumps and small pipes. The screens vary from coarse to fine- from those with parallel steel or iron bars with openings of about half an inch or more to screens with much smaller openings.

b. After the sewage has been screened, it passes into what is called a grit chamber where sand, grit, cinders, and small stones are allowed to settle to the bottom. A grit chamber is highly important for cities with combined sewer systems because it will remove the grit or grave that washes off streets or land during a storm and ends up at treatment plants.

c. With the screening completed and the grit removed, the sewage still contains suspended solids. These are minute particles of matter that can be removed from the sewage by treatment in a sedimentation tank. When the speed of the flow of sewage through one of these tanks is reduced, the suspended solids will gradually sink to the bottom. This mass of solids is called raw sludge.

d. The unwanted grit or grave from this process is usually disposed of by filling land near a treatment plant.

At present, there are two basic ways of treating wastes. They are called primary and secondary. In primary treatment, solids are allowed to settle and are removed from the water. Secondary treatment, a further step in purifying waste water, uses biological processes.

SECONDARY TREATMENT

Secondary treatment removes up to 90 percent of the organic matter in sewage by making use of the bacteria in it. The two principal types of secondary treatment are trickling filters and the activated-sludge process.

Trickling Filter

a. A trickling filter is simply a bed of stones from three to ten feet deep through which the sewage passes. Bacteria gather and multiply on these stones until they can consume most of the organic matter in the sewage. The cleaner water trickles out through pipes inthe bottom of the filter for further treatment.

b. The sewage is applied to the bed of stones in two principal ways. One method consists of distributing the effluent intermittently through a network of pipes laid on or beneath the surface of the stones. Attached to these pipes are smaller, vertical pipes which spray the sewage over the stones.

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Another much-used method consists of a vertical pipe in the center of the filter connected to rotating horizontal pipes which spray the sewage continuously upon the stones.

Activated Sludge Process

The trend today is toward the use of the activated sludge process instead of trickling filters. This process speeds up the work of the bacteria by bringing air and sludge heavily laden with bacteria into close contact with the sewage.

a. After the sewage leaves the settling tank in primary treatment, it is pumped to an aeration tank where it is mixed with air and sludge loaded with bacteria and allowed to remain for several hours. During this time, the bacteria break down the organic matter.

b. From the aeration tank, the sewage, now called mixed liquor, flows to another sedimentation tank to remove the solids.

The final phase of the secondary treatment consists of the addition of chlorine to the effluent coming from the trickling filter or the activated sludge process. Chlorine is usually purchased in liquid form, converted to a gas and injected into the effluent 15 to 30 minutes before the treated water is discharged into a watercourse. If done properly, chlorination will kill more than 99 percent of the harmful bacteria in an effluent.

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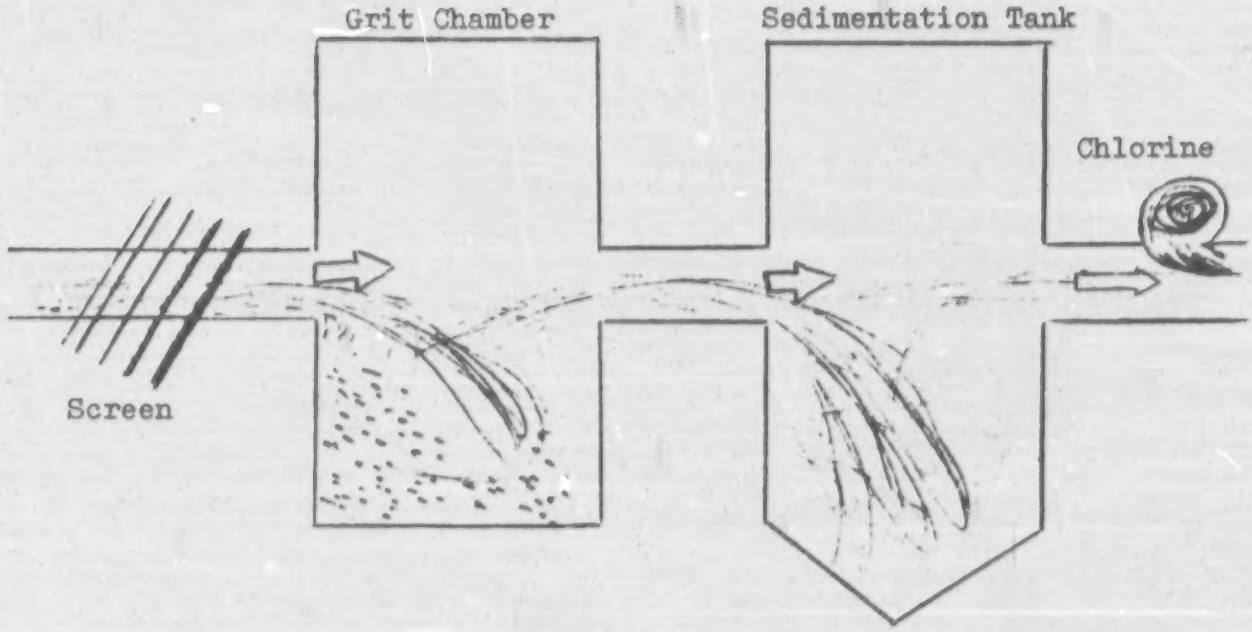
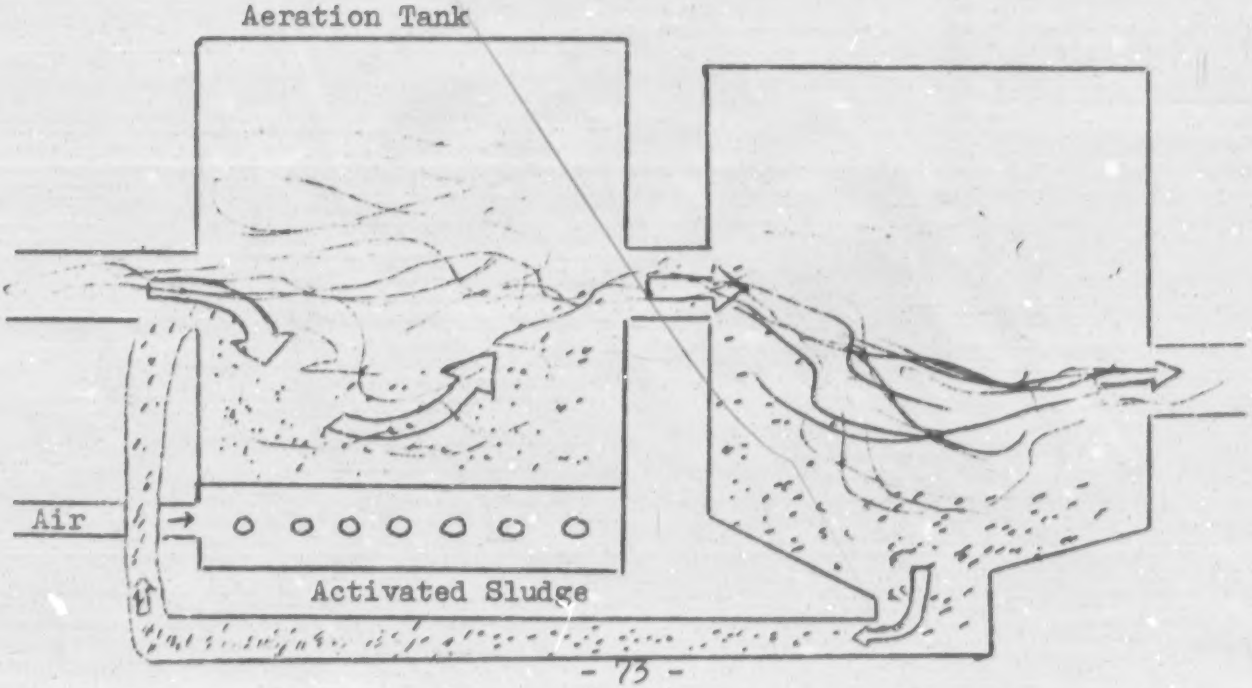
PRIMARY TREATMENT



SECONDARY TREATMENT



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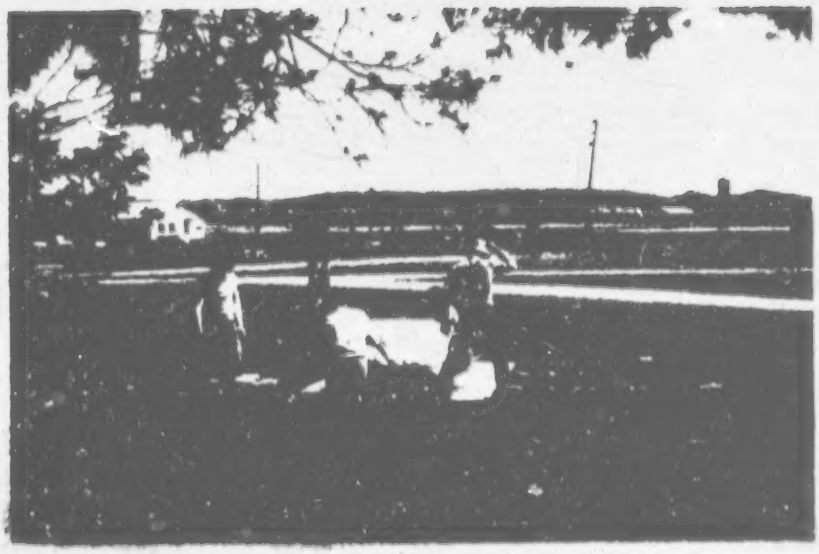
SCHOOL CAMPING



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ACTIVITY: Overnight Camping

PURPOSE: To put the student in a unique learning environment

OBJECTIVES: The student will:

1. experience social and democratic group living.
2. acquire outdoor living skills.
3. develop a deeper awareness, understanding and appreciation of nature.
4. become involved in real life (direct) learning situations and purposeful work experiences.

OVERNIGHT EXPERIENCE

An overnight camp-out is a unique learning experience for students and teachers. There are areas on the school property, public parks, and public use areas that are readily accessible for this type of activity. The camping program is available to all schools in the project area.

SCHEDULING

Any teacher may involve his or her class in the camping program although generally fourth grade students and older are involved in this type of experience. Overnight camping may be done any day during the week with a class. Scheduling may be done through the ECO-Center.

PLANNING

An ECO-Center staff member and classroom teacher will work together arranging the details of the camping experience. The ECO-Center will take care of camp supplies and materials needed for learning activities. The teacher should plan for the food purchases and instructional sessions. The class should be involved in the planning as much as possible. This is an important learning experience for them. They should plan their menu, figure costs, and select people for work details.

Often parents can be found to assist with the camp.

EQUIPMENT AVAILABLE

Basic camping equipment is provided for up to 30 students. This includes six tents, 2 stoves, 1 cooler, eating and cooking utensils, lantern and first aid supplies.

OUTDOOR LIVING SKILLS

Outdoor living skills which could be covered are:

1. Shelter
   a. Proper selection of tent sites
   b. Setting up & taking down tents
2. Proper Care of Camp Ground
3. Campfires
   a. For pleasure
   b. For cooking
4. Outdoor Cooking
   a. Stoves
   b. Campfires
5. Food
   a. Types & varieties of camping food
   b. Proper storage of food
6. Health, Safety & Sanitation

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SAMPLE PROGRAM

The following is a sample program, designed to give you an idea of the time factor, scheduling and activities that a camping program could involve. The teacher must have the flexibility to plan as he wishes. This time element could vary from an evening, night and part of the next day - to all day, evening, night, and all the next day.

SAMPLE SCHEDULE

1:00 - Arrive at camp, unload gear, carry to camp site.
1:30 - Meeting-general information, rules, safety
2:00-3:00 - Set up camp
3:00-5:00 - Awareness hike; or lesson
5:00-6:00 - Evening meal, prepared and eaten
6:30-7:00 - Clean up; free time
7:00-8:00 - Orientation, planned recreation, hiking, nature games.
8:00-9:00 - Campfire, songs, storytelling, poetry, stunts, marshmallows
9:00-10:00 - Star gazing, night hike
10:00 - Bedtime
6:30-7:00 - Early morning bird hike
7:00-8:00 - Breakfast; clean up
8:00-8:30 - Free time
8:30-10:30 - Two hour block of time for classes (learning activities planned by teacher, students, and ECO Staff)
10:30-11:30- Clean up and departure

The ECO staff again will try to be as flexible as possible in helping the teacher. Staff will try to go to any desired camp. Recommendations for camp sites include:

a. Thomson ECO-Center
b. Parks
c. Bluffville Outdoor Education Site
d. Potter's Marsh Public Use Area

Remember there should be restroom facilities available. The Center does have enough containers to bring a water supply along.

Sample permission slips and camping supply lists can be found on the following pages.

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Date_____

Dear Parents:

Our class is planning an overnight at _____ under the direction of the Upper Mississippi River ECO-Center. This will take place on the evening of _____and will end the following day at _____.

This is a new experience for the students of Carroll County.

I can assure you that adequate supervision for both boys and girls will be given at all times by adult chaperones.

I would appreciate your permission for your child to take part in this activity. Would you indicate your approval by signing this letter in the space provided below?

Sincerely yours,

_____
Classroom teacher

Food costs will be _____for _____meals.

I give permission for my child _____to take part in the over-night campout at _____.
I fully realize that all efforts will be made by the school to avoid the possibility of accident, that, however, should such an accident occur, I will not hold the school, the teacher, or chaperones or the Upper Mississippi River ECO-Center responsible.

Date_____ _____
Parent's Signature

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CAMPING - STUDENT SUPPLY LIST

1. Sleeping bag or blanket _____
2. Wash cloth and towel _____
3. Hand soap _____
4. Toothpast and brush _____
5. Comb or hair brush _____
6. Complete change of clothes _____
7. Boots or some type of waterproof shoe _____
8. Sweatshirt and/or warm jacket _____
9. Drinking cup _____
10. 1 large plastic bag _____

OPTIONAL ITEMS

1. Binoculars _____
2. Camera _____
3. Flashlight _____
4. Pajamas _____
5. Canteen _____
6. Mosquito repellant (in early fall) _____

DO NOT BRING

1. Radios
2. Money
3. Hunting knives

A small pack or shoulder pack for storing and carrying your supplies would be handy. A heavy plastic bag would work well.

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OVERNIGHT ACTIVITIES

CAPTURE THE FLAG

Hide an object a moderate distance from the camp site. Divide the group into two or more groups giving each group a compass trail to follow which will lead them to the object. Place items along the compass trail and require each group to bring back the items that were place on their trail as proof that they followed the trail to the object.

PLOT AND SWITCH

Have the class divided into two or more groups and ask each group to plot out a compass trail using the compass and pace method. At the end of each trail place a prize so each team can win. The effectiveness of the maps will be determined by the ability to get to your prize and return to camp in a pre-set time limit.

STRAIGHT LINE WALK

Chalk a straight line out on a field. Starting at point zero, a blindfolded student will attempt to walk along the straight line. A partner will follow and place markers every 10 steps, until all ten flags have been placed in the ground. Have the blindfolded student remove the blindfold and look at the path he made. Ask them to try and figure out what shape they would have made if they had been allowed to continue walking.

a. square b. triangle c. circle d. trapezoid

NUMBERS IN NATURE

Secret Numbers: Place notes along a designated route, each note having directions for securing a certain number or numerals. If all observations are made correctly and directions followed, the sum of the numbers secured should equal the Secret numbers in the hands of the leader.

BLINDFOLDED TRAIL

Blindfold every other student. The other student serves as a talking leader. Have students follow the trail and use senses of touch and hearing. This exercise gives the student a new dimension in learning.

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SCHOOL SITE ACTIVITIES

The purpose of this section is to provide the teacher with some examples of activities that could be used on the school site or in the immediate community. These activities are in worksheet form so they may be copied directly.

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ACTIVITY: Art on the School Site

DISCIPLINE AREA: Art

PURPOSE:

1. To increase children's powers of observation.
2. To increase children's understanding of interrelationship between art and nature.
3. To acquaint children with use of natural objects in art projects.

OBJECTIVES: The children will demonatrate their understanding of relationship between nature and art by completing a project using nature materials.

LEARNING ACTIVITIES:

In order to achieve creativity children should choose an area in which they plan to work. Care should be taken that no rare or protected species is used and the ecology of the area is not disturbed.

Areas in which they may choose to work include:

posters
dioramas
weaving
sand paintings
seed pictures
dried material arrangements
painting with natural dyes
figure construction using burs, clay, sticks, etc,
collages

Some Ideas (From Nashville Metro Schools Environmental Education Department)

1. Discovering shapes and patterns are very important as a first step in arts and crafts. The many colors and shades of colors along the trail can help the child understand more about colors. Using homemade clipboards, let the children try outdoor sketching, trying more for shape and feeling them for details. The many shapes found in nature can help children to learn to draw using shapes and then refining them. Heart shaped leaves, triangles, square stems of the mint family, and circles can be used to try design pictures that can later be made into more finished pictures.

2. There are many things in nature that can be used to make pictures. If each child takes a plastic bag with him around the school grounds he can pick up twigs, stones, bark (not from a living tree), dried grasses and seed pods. This also gives the leader a good chance to teach about conservation--leaving things for other people to see, and not picking flowers unless they are weeds in a field.

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Art Ideas (cont.)

These materials can be taken back to the school and be combined into a picture. Use heavy cardboard or wood as a backing. Stick men and animals are easy to make. Stones can be used for heads, and shapes of stones used for ducks or whatever they appear to be. Maple wings make good bird wings or fish. Caution the children not to pick green things to use in their picture as these will soon dry. Usually there are many dry grasses along the trail that can be used as trees or grass. Dry leaves can be cut to make dresses and bodies. Log cabins are easy to make with twigs and bark roof. Small rocks can be used to make the chimmey.

3. Small rocks can be painted to look like "bugs". Use pipe cleaners as the antenna or find dry grass with an end on it. Good insect books will have many ideas for the children. The Ladybird beetle is a good simple one to try.

4. Leaves can be used to make many kinds of prints. One of the simplest ones with children is a crayon print. The leaf is put, vein side up, on a piece of cardboard. Put a thin piece of paper over the leaf and rub with a crayon. Several colors can be tried to get different effects. Overlapping leaves will also make an interesting design. These designs can be used in making letter paper, Mother's day cards or put on the front of a scrapbook.

5. Scrapbook covers or placemats can be made with wax paper. Leaves can be ironed between two pieces of paper and the edges cut with pinking shears to produce a nice edge. Clear contact paper is the new way to show off leaves and other natural items. The items should be put on the clear contact first and then the contact paper put on the backing and smoothedtowards the edge. Seeds and other natural objects can be used with the contact paper.

6. Collecting spider webs: Materials needed include spray paint (white) dark big construction paper and a pair of scissors. Try to find a spider web that is on a fence or is open so you can reach it. Spray the white paint on the web. Put the dark construction paper up against the side of the web part, then remove the paper. The paint will make the web stick to the paper and show its design. In order to preserve it use a coat of plastic spray. There are many patterns of spider webs and these can be used in insect study as well as a decoration for the room.

7. If there is a study of the American Indian there are many crafts that will help teach the interesting history of these people. The children can paint like the Indians did, using either soft rocks (usually chert) ground into a powder with linseed oil added to make the paint. This of course makes only earth colors, so the children may want brighter colors for their picture. If there is a field or open area along the trail or in the school yeard many weeds can be found. Let the children draw an outline of a picture and then use natural colors to "paint" it. They should tear up the leaves, flowers, etc. before using them in order to get to the coloring matter. Be sure they use only weeds. The dandelion makes a beautiful yellow.

8. Natural dyes can be made from many things found on most school sites-poke berries, walnut hulls, and other plants can be used. Use big white handkerchiefs and try tie-dying. These can then be used as cowboy or pioneer scares.

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ACTIVITY: Environmental awareness and vocabulary study

DISCIPLINE AREA: Language Arts

PURPOSE: To help the pupil broaden his vocabulary and improve spelling by observing his environment.

OBJECTIVES:

1. The pupil will demonstrate his increased awareness of the school environment by naming and spelling correctly at least 50% of the words in the activity.

LEARNING ACTIVITY:

1. Equipment: Each pupil has a worksheet and a pencil.

   Directions: Look around you. List as many words as you can find that begin with the letters in the left hand column. In the right hand column list words that end with those letters. If you do not know how to spell them, find the correct spelling.

1. b	1. t
2. c or ch	2. n
3. g	3. m
4. t	4. h
5. i or in	5. g
6. n	6. w
7. r	7. p
8. s	8. k
9. m or ma or me	9. e
10. sa	10. r
11. se	11. l
12. a	12. d
13. l	13. f
14. w	14. s
15. p or pl	15. b
16. h	
17. wo	
18. y	
19. f or fl	
20. d	

2. List words that contain the following vowel combinations.
   o and e (example stone)
   u and i
   e and e
   a and e
   i and e
   vo
   vu
   a and o
   ee
   oi
   u and e
   ai

   Really hard ones

   u and a and e
   a and o and e
   i and e and a
   u and i and a

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ACTIVITY: Plant and animal identification

DISCIPLINE AREA: Language Arts

PURPOSE: To broaden the pupil's ability to observe and name animal and plant life which is part of his environment.

OBJECTIVES: The student will show an increase in his awareness of the plant and animal life of his environment by identifying at least 50% of the plants and animals or animal signs found on the school site.

LEARNING ACTIVITY:

School Site Study

Each pupil has a chart to be filled in. Some school sites will be richer than others, but all should be able to fill part of the chart. Animal signs may be used. This is a good exercise in the use of reference works.

Mammals	Birds	Insects & Other Animals	Plants

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ACTIVITY: School Site - Mini-Climates

DISCIPLINE AREA: Science

PURPOSE: The student will recognize that natural areas and man-made structures create local climatic conditions.

OBJECTIVES: The student will:

1. demonstrate his ability to investigate temperatures on different surfaces.
2. will recognize reasons for differences in temperatures in sunlight and shade.
3. will recognize that colors affect the temperature.
4. will recognize that air movements affects the temperatures.

LEARNING ACTIVITY: Mini-Climites

Even on a school site there are many different temperatures. The differences might be as much in this one area as between two states such as Maine or Arizona. The Little or micro-climate is the layer of air near the ground. Even here the difference in wind spead, temperature, humidity and moisture may be as great as changes all over the country. This difference will affect what animals and plants live there.

Pick several different areas on the school site - - - Pick several in the sunlight and several in the shade - - - Measure the air temperature 1 inch above the surface (allow five minutes for each reading - - -

	grass	bare dirt	concrete	asphalt
Sunlight temp.				
shade temp.				

Why do you think the temperatures will be different? _____ Put a white sheet of paper under the thermometer on the asphalt in the sun and take another reading. Is it the same as before? _____ Why? _____

Take two cans, take the paper off of one so it is shiny. Paint the other black - - - Fill both with water. Put them into the sun for 1/2 hour. Which has the highest temperature? _____ What made it be higher? _____ Why would the grassy area be cooler than the concrete or asphalt? _____ What is in the soil that keeps that area cooler? _____ Find an area on the school site about a yard square - - - Take several readings. Are they the same? _____ Why not? _____ Dig down into the ground and take a reading. Is there a difference? _____ Does wind have an affect on temperature? _____ Take temperature in an open area (affected by wind) _____ Take temperature in a protected area (no wind) _____ What is your conclusion about the effect of wind on temperature? _____

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ACTIVITY: School Site - Tree Study

DISCIPLINE AREA: Science

PURPOSE: To recognize the importance of trees in our environment.

OBJECTIVES: The student will:

1. be able to differentiate between deciduous and evergreen trees.
2. recognize fruit of trees as means of reproduction.
3. recognize the planting of trees as part of a landscaping plan.
4. recognize difference in growth patterns.
5. recognize the interrelationship of trees and animals.

LEARNING ACTIVITY: Tree study

Answer these questions:

1. How many trees are there on your school site?_____
2. How many DIFFERENT kinds of trees? _____
3. How many are deciduous? _____How many evergreen? _____
4. Pick out the largest tree and measure its circumference._____
5. Pick out the smallest tree, use a tape measure and measure the circumference about three feet above the ground._____
6. Are these trees of the same kind? _____Is one evergreen? _____.
7. How do you think these trees got to be where they are standing? _____
8. How many of the trees have "pretty flowers? _____
9. Name as many "fruits" of the trees as you can. _____
10. How does each kind of tree help animals? _____

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ACTIVITY: School Site - Insects

DISCIPLINE AREA: Science

PURPOSE: To introduce to the students various aspects of insect life on their school grounds.

OBJECTIVES: The student will during a ten-minute hike:

1. identify three types of insects.
2. find insect eggs.
3. find evidence of insect eating habits.
4. find evidence of insect effect on plants.

LEARNING ACTIVITY:

Preparation:

1. List insects you may possibly see on trip.
2. List places to look for insects.
3. Learn to identify insect eggs.

On Field Trip:

1. List insects seen or briefly describe so they may later be identified.
2. Collect evidence of insect work.

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ACTIVITY: Lawn Study

DISCIPLINE AREA: Science

PURPOSE: To investigate the interrelationship of the communities found in a lawn.

OBJECTIVES: Upon the completion of the lawn study the student will be able to:

1. identify the two basic communities found in a lawn.
2. write a paragraph stating three ways in which an area of heavy use is the same as an area of light use and three ways in which it is different.

LEARNING ACTIVITIES:

Equipment needed: notebooks and pencils, handlens.
Procedure:

Divide class members into pairs, each pair to study a yard square plot.

1. List the plants found in your plot. Which plant is the most common?
2. List insects found in your plot. Which insect is the most common? (It would be helpful if the student drew pictures of any unknown plants or animals for later identification.)
3. Is there any other animal life present? If so, what?
4. Are there any unnatural objects on your plot? If so, what?
5. Is your plot in a heavily traveled area, a lightly traveled area, or an unused area?
6. How has heavy traffic affected:
   a. grass?
   b. weeds?
   c. flowers?
   d. insects?
   e. other animal life?
   f. soil?
7. How has light traffic affected:
   a. grass?
   b. weeds?
   c. flowers?
   d. insects?
   e. other animal life?
   f. soil?
8. How does the lawn differ where there is no traffic?
   a. grass?
   b. weeds?
   c. flowers?
   d. insects?
   e. other animal life?
   f. soil?

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ACTIVITY: School Yard Census

DISCIPLINE AREA: Science

PURPOSE: To help the student develop an awareness of the infinite variety of natural and man-made objects which are part of the school site environment.

OBJECTIVES: The student will

1. demonstrate his power of observation to identify natural and man-made objects on the school grounds.
2. display his aesthetic values by pointing out those items which have low aesthetic value and those which have high aesthetic value.

LEARNING ACTIVITY:

Student worksheet on the following page.

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Census

Many of you may have hear of the "people" census that the government takes every 10 years. On the school yard there are many living things. There are also many things that man has put on the school site. Below is a check list. Take a walk around your school yard and check off all of the things you see.

Plants or Animals

ant or ant hill _____
squirrel nest _____
wasp nests _____
holes in ground made by insect _____
bird nest _____
bird _____
animal print _____
half eaten leaf _____
spider _____
earthworm _____
grasshopper _____
bee _____
insects on bark of tree _____
pill bug (sowbugs) _____

dandelion _____
clover _____
wild strawberry _____
sour grass _____
moss _____
shrub _____
vine _____
a yellow weed _____
lichen _____
gall _____
evergreen _____
broadleaf tree _____
mushroom _____
tree fruit _____

flagpole _____
fence _____
telephone pole _____
sidewalk _____
parking lot _____
play area _____
trash cans _____
fire plug _____
stop signs _____
bicycle rack _____
gutter _____
light meter _____
transformer _____
cement area (blacktop) _____

Which animal do you think is the most numerous on the site? _____

Which plant has the greatest number? _____ Why does this plant grow so well on the school site?

Which of the man-made items are pretty? _____ Which are ugly? ___
Could the ugly ones be made better looking? _____ How? _____

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ACTIVITY: _ School Site Use

DISCIPLINE AREA: Math

PURPOSE: To help the student develop his sense of estimating distance and his ability to work with different types of measurements.

OBJECTIVE: The student will:

1. demonstrate his ability to estimate length, wideth, height, diameter and weight.
2. demonstrate his ability to use different tools and skills to determine the actual length, width, height, diameter or weight of item.

LEARNING ACTIVITY: Math-in-the-Out-of-Doors

MATH IN THE OUT-OF-DOORS

DISTANCE AND HEIGHTS

1.	Guess what the distance is between the street and the front door of the school.	Your guess _____ ft. Actual _____ ft.
2.	Guess the width of the school	Your guess _____ ft. Actual _____ ft.
3.	Guess the height of the school	Your guess _____ ft. Actual _____ ft.
4.	Guess the weight of a rock	Your guess _____ lbs. Actual _____ lbs.
5.	Guess the length of the swing set	Your guess _____ ft. Actual _____ ft.
6.	Guess the height of the flag pole	Your guess _____ ft. Actual _____ ft.
7.	Guess the circumference of a tree	Your guess _____ ft. Actual _____ ft.
8.	Guess the height of the back door of the school	Your guess _____ ft. Actual _____ ft.
9.	Guess the weight of a block of wood	Your guess _____ lbs. Actual _____ lbs.
10.	Guess the weight of a friend	Your guess _____ lbs. Actual _____ lbs.

(It will be necessary to have a tape measure handy so the children can measure the actual distance. Some helpful hints on how to measure heights are also nice to have.)

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ACTIVITY: School Site Problems

DISCIPLINE AREA: Social Studies

PURPOSE:

To help the student recognize his responsibility in solving problems and developing the tools to solve the problems.

OBJECTIVES: The student will:

1. demonstrate his ability to collect and classify litter.
2. demonstrate his ability to discover areas of problems on his school grounds.
3. demonstrate his ability to develop solution to problems on his school grounds.

LEARNING ACTIVITY:

Student check sheet on the next page.

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SOCIAL STUDIES

Litter is one of the worst problems we now face. The manufacturers make so many things and most of the packages are thrown away. We have so much that we often do not think about throwing things away. Below is a list of some litter that might be found on your school yeard. Divide in groups. Take a litter bag. Have one person as a recorder. As you pick up the litter record it on the check sheet. The second list is of problems that you might have on your school site. Check any you see, then, as a group, try to figure out how you and the other classes might correct the problem.

Litter		School Site Problems - What to do	
broken glass	_____	low wet places	_____
cans	_____	soil erosion	_____
paper	_____	no grass cover	_____
plastic materials	_____	overflowing trash	_____
bottles	_____	cracked sidewalks	_____
bottle or can tops	_____	holes in street	_____
crayons or parts of pencils	_____	broken street lights	_____
rubber bands	_____	peeling paint	_____
pieces of cloth	_____	old odors	_____
pieces of metal	_____	car or bike ruts	_____
milk cartons	_____	gravel getting on grass	_____
garbage	_____	broken windows	_____
pieces of old toys	_____	no trees	_____
any others (Name)	_____	others	_____
	_____		
	_____		
	_____		
	_____		
	_____		

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ACTIVITY: Building materials survey

DISCIPLINE AREA: Social Studies

PURPOSE: To acquaint pupils with modern building materials.

OBJECTIVES:

1. The pupil will identify at least 75% of the building materials in and around school site.
2. Each student will be able to write a paragraph on how one material is made.
3. Each student will be able to explain how four out of five of the materials named are protected from weathering.

LEARNING ACTIVITY:

1. What building materials are used for:
    1. school building
        (a) inside?
        (b) outside?
    2. restroom floors?
    3. sidewalks?
    4. curbs?
    5. playground paving?
    6. street?
    7. utility poles?
    8. eavespouts?
    9. drain pipes?
2. Which of these building materials are made of:
    1. clay?
    2. cement?
    3. petroleum products?
    4. metal?
3. All building materials are subject to weathering. How are the following protected against weathering?
    1. bricks?
    2. ceramic tile?
    3. wood
        (a) buildings?
        (b) utility poles?
    4. cement blocks
    5. metal?
4. What is the difference between adobe and brick?
5. Why is adobe used only in the southwest?
6. Why are bricks or cement blocks used instead of wood in school construction?

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ACTIVITY: Outdoor Hunt

DISCIPLINE AREA: Interdisciplinary

PURPOSE: To involve students in a group exercise that will increase their awareness to the school environment.

OBJECTIVE: Students will demonstrate their increased environmental awareness by scoring a minimum of 20 points on the Outdoor Hunt.

OUTDOOR HUNT

1.	Find and pick up two pieces of litter.	2 pts.
2.	Find two different trees.	2 pts.
3.	Identify the two trees you found.	1 pt. bonus
4.	Find two different shrubs.	2 pts.
5.	Identify the two shrubs you found.	1 pt. bonus
6.	Find signs of two animal homes on the school grounds.	2 pts.
7.	Find some animal tracks on the school grounds.	1 pt. bonus
8.	Find an outside trash can and put the litter you picked up in it.	2 pts.
9.	Find an outside bird feeder on the school grounds.	2 pts.
10.	If there is not a feeder on the school grounds, why don't you and your classmates build one later?	5 pts. bonus
11.	Think of two adjectives describing the weather.	2 pts.
12.	Think of two adjectives describing the grass.	2 pts.
13.	Think of two adjectives describing the trees.	2 pts.
14.	Write two different words describing TWO different sounds you heard while on the school grounds.	2 pts.
15.	Name two insects you saw on the school grounds.	2 pts.

(Each teacher should coordinate the rules for the hunt to fit his or her own school site.)

CLASSROOM INSTRUCTION

Environmental education is not an additional subject to be added to an already often crowded schedule, but is interdisciplinary and should be integrated into all subject areas. The following section contains sample instructional activities.

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ACTIVITY: Pollution

DISCIPLINE AREA: Math

PURPOSE: To make the student aware of pollution he is contributing to the total community and U. S. problem.

CONCEPTS COVERED: 1, 2, 6, 7, 9, 11, 12, 13, 15, Pages 3, 4, 5.

OBJECTIVES: The student will:

1. be relating math to real life
2. develop an attitude for responsibility toward personal resourcefulness
3. suggest how increased population growth will affect the pollution problem
4. compute problems on pollution

LEARNING ACTIVITIES:

a. Invite a possible resource person from the local landfill site to explain the operation of the site.
b. Use the statistics presented in the following examples.

1) The population of our community is _____ and _____ tons of garbage per _____ (day, wk.) are collected.
What is amount of garbage collected in a month?

2) If you contribute 6 pounds of garbage per day, how much will you have contributed in month?_____ in a year? _____

3) 48 tons of garbage are taken to the landfill by a five ton truck, how many trips were made?_____

4) It took two years to fill 1/6 of the site, how many years will it take to fill the entire site at this rate? _____

5) The U. S. spends $4 billion on garbage collection and disposal. If $3,200,000 is spent for the collection, how much is left to spend for disposal?
_____

6) Rats are a problem at a landill site. If a femal rat has nine litters per year with 12 baby rats per litter, how many off-spring will she produce in a year?_____

7) Cars add to our pollution problem.
Four fathers drive to work daily to _____ (nearby city).
Each car uses 4 gallons of gasoline per day. How much gasoline could be saved if all four fathers rode in one car? _____

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ACTIVITY: Natural Resource Study

DISCIPLINE AREA: Science, Social Studies

PURPOSE: To help the student realize the importance, amount of, and man's influence on natural resources.

CONCEPTS: 5, 9, 10, 12, 13, pages 3,4,5.

OBJECTIVES: Pupils as a result of a forty-five minute study and discussion period will demonstrate an increased understanding of the above concepts by being able to:

1. identify important natural resources of the U. S.
2. identify violations in ecological practices on the study map.
3. offer logical solutions to problems presented on the study map.
4. complete the worksheet.

LEARNING ACTIVITY:

Teacher Preparation: Make transparency of map. Make copies of map and worksheet for each pupil.

Class Discussion: This activity seems to work best if teacher leads in the discussion of the lesson.

Introduction: Be sure pupils know meaning of term "natural resources".

Name and discuss some of our most important natural resources. Lead discussion to soil, air, and watet as those are most important to immediate life.

Map work and discussion: Go over questions, children may use colored pencils to mark areas on maps. Use of colored pens on overhead transparency would help them. Outlining the streams and lakes in blue would make easier interpretation. Pupils should be able to point out where good ecological practices are being violated. Pupils will be able to offer logical solutions to some problems, and will be made aware of others that require long range planning for solutions.

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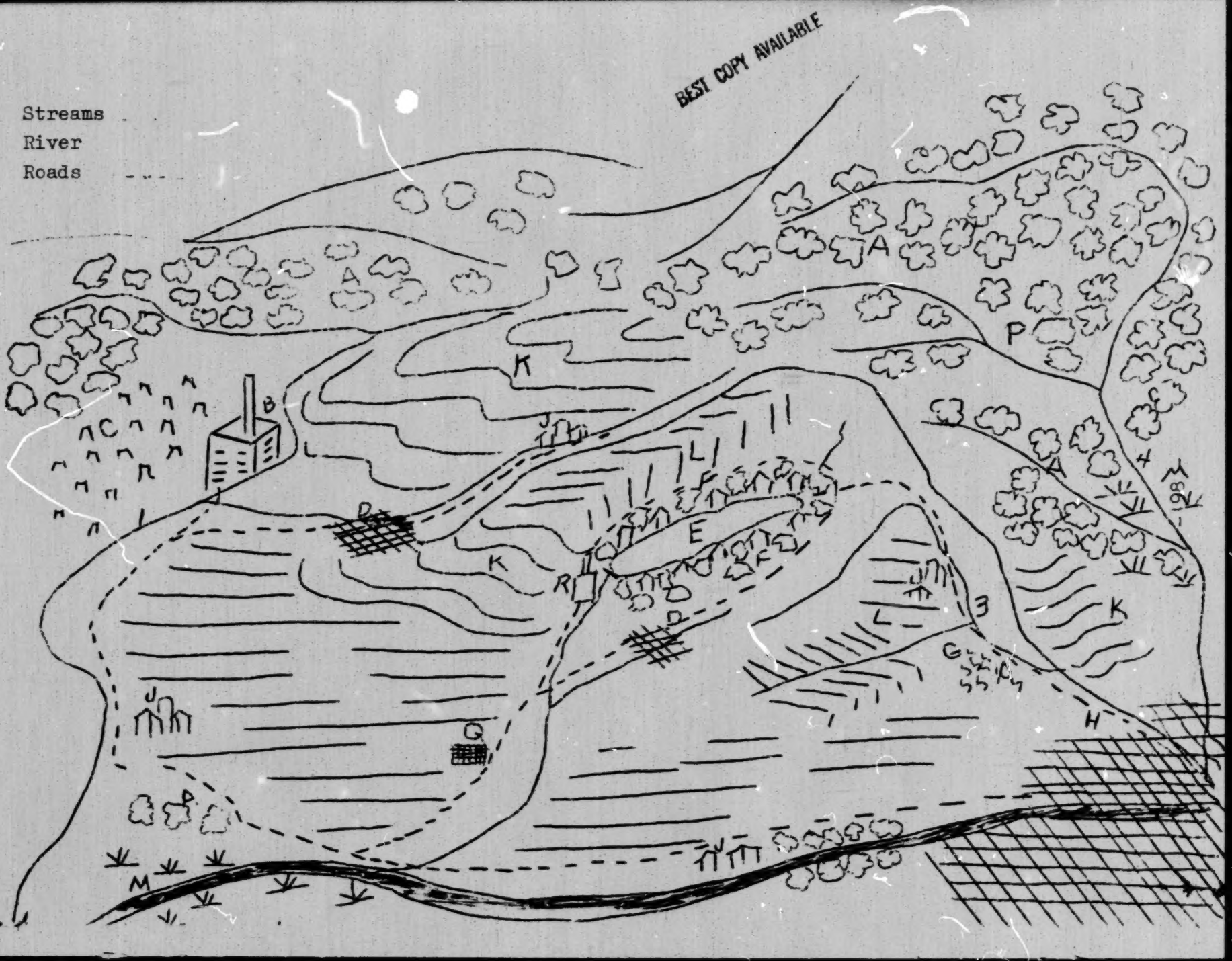

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Worksheet Lesson to Be Used with Map

(Map should be made into a transparency)

I. Define natural resources.
II. Name some of our most important natural resources.

Map Study for Air, Soil and Water

Show the divide between two river systems.

I. Areas marked A are forested.
   A. Which of these forests is on high land and which are on low land?
   B. How do you know that the forest on the divide is on high land?
   C. If a forest is on low land where is it apt to be?

II. B is a paper mill. C is cut-over land. The forest was cut to supply the mill. The waste from the mill goes into stream 1.
   A. Is forest C renewable?
   B. How can the paper company hurry the renewal of the forest?
   C. What happens to the soil when the forest is cut?
   D. Is stream 1 polluted? Why?
   E. Will the pollution of stream 1 affect the river into which it flows?

III. Areas marked D are small towns.
   A. Could these towns pollute the streams? Give several examples.
   B. Could these towns pollute the air? Give several examples.
   C. Do small towns pollute the air as much as cities do?

IV. Areas marked K are contour plowed; areas marked L are not.
   A. Which of the areas, K or L, will erode worse? Why?
   B. Is the soil renewable? How?
   C. Does farm erosion affect the streams?

V. The area marked P is a forest preserve. Areas marked M are marshes.
   A. Which marsh would have the most wildlife? Why?
   B. Which marsh would probably be polluted?

VI. Area marked E is an artificial lake made by damming a stream. A resort has grown up around the lake. There is no sewage system at the resort; each house has its own septic tank.
   A. Would you expect the lake and stream to be polluted? Why?
   B. If the lake is not polluted what could it be used for?
   C. What can be done to stop pollution?

VII. R. is a power plant.
   A. What produces the power?
   B. What is this power used for?
   C. Would this plant pollute the stream?

(over)

Worksheet Lesson to Be Used with Map

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VII. G is a dump.
- A. How does the dump affect the stream?
- B. What can be done about dump pollution?

IX. Q is a feedlot.
- A. Will the feedlot have any affect on the stream?
- B. Will this polluted stream affect the river?
- C. What can be done?

X. H is a city.
- A. Will the city pollute the river?
- B. Was the river polluted before it reached the city?
- C. Will the city pollute the air?
- D. Give some solutions to the pollution problems.

XI. The city H needs more water.
- A. Why can't it use water from the lake made by the dam?
- B. Why can't river water be used?
- C. Is there any stream in the area which probably is not greatly polluted?
- D. If stream 4 is used for water it will have to be dammed to make a reservoir. What will happen to the marsh? to the forest?
- E. What would such a dam do to the balance of nature?

XII. Areas marked J are farms.
- A. Do farms add any pollution to streams?
- B. Do farms ever upset the balance of nature?

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ACTIVITY: School Environmental Science Survey

DISCIPLINE AREA: Science

PURPOSE: To make students aware of areas of waste and pollution

CONCEPTS: 8, 9, 10, pages 4 and 5.

OBJECTIVES: The students will:

1. demonstrate their ability to take a survey, make bar graph, and keep records.
2. identify areas of waste and pollution in their schools.

LEARNING ACTIVITY:

Before starting this activity, discuss with the class the reasons for the present shortages. Discussion should lead to the following concepts: some resources are limited (non-renewable), resources are not evenly distributed, and industrialized nations are using resources faster than ever. There are plenty of current examples in the news to center the discussion on. Discussion should lead to what can be done to eliminate the shortages. Solutions can be divided into two areas: getting more or using less. The following activity could then be used as a means of investigating the second alternative, using less.

SCHOOL ENVIRONMENTAL SCIENCE SURVEY

You are to examine your total school site for areas of possible pollution and waste. Also areas of use where energy is used and/or misused.

The most used item in a school is, by far, the use of paper. You are asked to carry out a survey of areas and people in and around your school to check on the amount and use of paper and the amount and method of discarding waste in your school. Keep records for 3 or 4 weeks. Make all observations at the same time each day.

A. Restroom -- Ask the students in your class how many towels they used when they wash their hands. Record each day the amount used and put your results on a graph.

B. Classroom -- Between classes count the number of sheets of paper in the waste basket which have been written on only one side. Is there a big enough amount to call it wasteful? Keep a record for 2 or 3 weeks and record your results on a graph.

C. Office -- Ask the secretary how much paper she uses each day. Ask to check the waste basket for paper that could be used again for scratch paper or for notes. If there is some that could be used again, ask her why she doesn't use it again. Record her answer.

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D. Kitchen -- Ask the cooks how much food is wasted each day. What types of things are most often thrown away? What do the cooks do with the containers that the food comes in? If you feel that their method of disposing of the containers is not good for the environment ask them why they do it that way and if they think there could be a better way. If there is a better way, why don't they use it? Check back in a couple of months to see if there has been any change.

E. Janitor -- Ask him how many bags of paper he collects every day. How does he get rid of the paper? If you feel this way of getting rid of the paper is not good for the environment ask him why he does it this way and if he couldn't find a better way of doing it. Record his response. Check back in a couple of months to see if there has been any change.

F. Teacher -- Ask your teacher to keep a separate basket or bag for all the things he or she throws away during the school day. Do not let them change their habits, but just use a separate container. Look over the things thrown away to see if any of those things could realistically be reused. Look closely over the paper thrown away and count the number of sheets that were thrown away that could be reused. Record your count on a graph.

G. School Grounds--Count the amount of trash that is found on your school grounds (paper and cans). Keep a graph for each day of the amount of paper and the amount of cans you find. Notice day-to-day changes, try to explain why. During the last recess of the day pick up all the trash.

Along with the school survey, an interview tith the local school principal or superintendent will help in your investigation of the energy crisis in your school. This can be done at a later date than at the time you do the items A-G.

You will have to write a letter to your superintendent or principal asking him to come to your class to answer the questions listed below. Enclose in your letter a copy of the questions and allow him plenty of time to respond to your request.

HAVE EVERYTHING WELL ORGANIZED SO IT CAN GO SMOOTHLY. Have people ready to ask questions and a person prepared to welcome him to the class and at the end of the interview to thank him for coming. If there are other questions you wish to ask, do so.

QUESTIONS

A. What kind of energy is used to heat our school?

Have we had trouble getting fuel? If yes, why?

(next page)

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SCHOOL ENVIRONMENTAL SCIENCE SURVEY

QUESTIONS (cont.)

B. Of the fuel we use, how much do we use during a school year? Could this amount be cut down? If yes, are we doing it? If no, why not?

C. Are all the classroom and offices set at the same temperature? If no, why not?

D. How much does it cost for electricity for this school building? Where is the most electricity used? Why?

Are there places where we could cut down on our use of electricity?

If yes, are we cutting down and where are these places?

If there are places and we are not cutting down, why not?

If no, why aren't there any places to cut down on our use?

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ACTIVITY: Wildlife Management (Birds)

DISCIPLINE AREA: Language Arts.
Social Studies

PURPOSE: To help students realize that they can have an active part in wildlife conservation.

CONCEPTS: 12, 14, 15, pages 4 and 5.

1. Man has the ability to manage and change his environment for good or bad.
2. The careful use and management of natural resources is called conservation.
3. Wildlife is considered a natural resource. It is a necessary part of life and must be managed intelligently.

OBJECTIVES: The students will be able to:

1. construct and display 2 different types of bird feeders
2. read and follow directions which will enable them to build a bird feeder of their choice.
3. write a creative story explaining, from a bird's point of view, the difficulty of finding food.
4. construct and keep a diary concerning the birds he has observed.
5. name several species of birds.
6. tell that federal laws are necessary to protect the eagles in our nation, and why the "fathers of America" chose the bald eagle as a symbol of our country.
7. see that every state has a bird for one of its symbols.
8. research and debate the merits of the turkey vs the bald eagle as a national symbol.
9. identify the sections of the western hemisphere covered by each of the 4 major flyways.
10. make a quill pen.
11. tell the importance of the quill pen in American History.

LEARNING ACTIVITIES

1. Make a bird feeder using any of the following suggestions. Instruction for building feeders are at the end of this unit.
2. Write a story describing, from a bird's point of view, the problem of finding food for itself and its young.

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3. The student will construct a diary having at least 8 pages, depending on the teacher's discretion. The left half of the page should be used for diary and the right half for pictures of birds observed that day.

4. Play "Bird" Game. This is similar to Fruitbasket Upset, except give the children names of birds.

5. Organize 2 groups; a bird group and a symbol group. Assign the bird group to research:

   1) Importance of the eagle to the balance of nature.

   2) Descriptions of the bald eagle and the American golden eagle.

   3) Eagle's environment, nesting and food habits

   4) Write to National Audubon Society for information about its program to protect the bald eagle.

   5) Write to the U. S. Forest Service for information about their program to protect the bald eagle on the National Forests.

   Assign the symbol group to research:

   1) Meaning of symbol

   2) Why symbols are used

   3) How symbols of America's heritage are used

   4) Where the emblem of the U. S. is used (Great Seal, President's flag, money)

6. Using poster board, draw or construct a large tree.

   Have each child choose a state and find the state bird, combine any states which have the same bird. The student should make a small colored replica of the bird to paste upon the tree.

7. Benjamin Franklin at one time said that the national bird should be the turkey.

   Divide your class into 2 groups. One group will be researching and debating on the merits of the turkey as the national emblem, and the other the bald eagle. (their debates could possibly be taped first)

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8. Man has been aware of migration since ancient times. Early man did not doubt that large birds could make great flights, but he was puzzled at the disappearance and reappearance of small birds. As a result, several main theories were advanced.

   1) Transportation - According to this theory, small birds hitchhiked a ride "piggy-back" style on the backs of larger birds. Even today, one reads newspaper stories of Canadian geese carrying hummingbirds on their backs. These reports when investigated proved to be false.

   2) Transmotation - Aristotle, a most important naturalist of olden times, insisted that one species turned into a different species for part of the year. He claimed that the European robin changed into a European redstart for the summer.

   3) Trip to the Moon - An unknown Englishman in London, England, in 1703 introduced a theory that birds migrated to the moon on a trip that took only 60 days.

   4) Hibernation - Similar to some amphibians, reptiles, fish and insects, swallows were thought to bury themselves in the mud and hibernate for the winter. Studies in 1946 by Dr. E. C. Joeger in S. E. Calif. showed that a poorwill (a small night bird of the whip-poor-will type) can remain inactive in a deep sleep-like condition for 88 days. Whether this can be called true hibernation or not needs more study. Early theories have been replaced by new ideas resulting from scientific studies and data collected from bird banding. Still, the age old riddle of migration is far from solved.

   More than 1/3 of the world's species of birds migrate. In the Americas there are 4 major flyways 1) Atlantic, 2) Mississippi, 3) Central and 4) Pacific.

   Using a map of the Western Hemisphere have the students color in and label the 4 major flyways.

9. Each student should take a flight feather (these can be purchased in a craft shop) and cut off the end of the quill. Experiment with various juices, food coloring, bluing and other materials for ink.

   Find copies of various historical documents which were originally written with quill pens. Have each student make a copy of a section of one of these documents.

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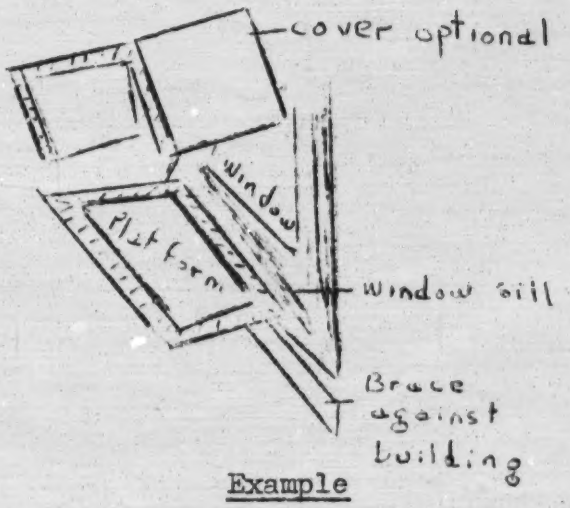
BIRD FEEDERS

WINDOW SILL FEEDER

Directions:

1. Make a simple platform feeder to be placed outside the school window.
2. Put a ledge on the feeder.
3. Place a brace against the building to hold the platform.
4. See, suet, bread crumbs, nuts, or raisins may be placed on the shelf.

Example:



Example

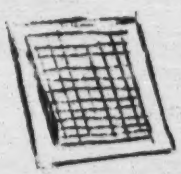
PINE CONE WITH MELTED SUET OR PEANUT BUTTER

1. Fill pine cone with melted suet or peanut butter or stir mixed bird seed into melted suet. Let drip into open cone.
2. Let cool
3. Attach a cord to cone and fasten to limb of tree.

Example

PEANUT BUTTER BOARD

1. Fasten screen upon a block of wood.
2. Cover thickly with peanut butter.
3. Fasten block on trunk of tree.



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BLEACH BOTTLE FEEDERS

Directions:

1. Bring 2 bleach bottles both the same size.
2. Take your first bleach bottle and cut it as shown in diagram (a).
3. Take your second bottle and cut a couple of notches to allow the food to escape as shown in diagram (b).
4. Refer to diagram (c). Fill the feeder through the top, then put on the cap.
5. Attach string to the handle to hang feeder. (diagram c)
6. Assemble the two bottles, using masking tape as shown in diagram c.

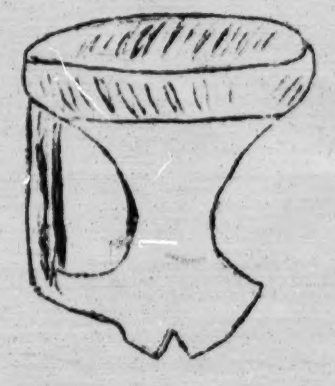

Diagram b

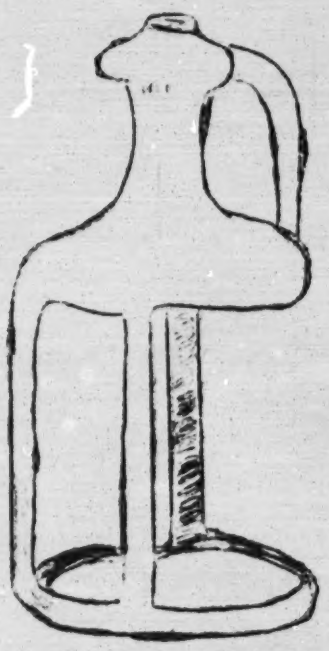

Diagram a

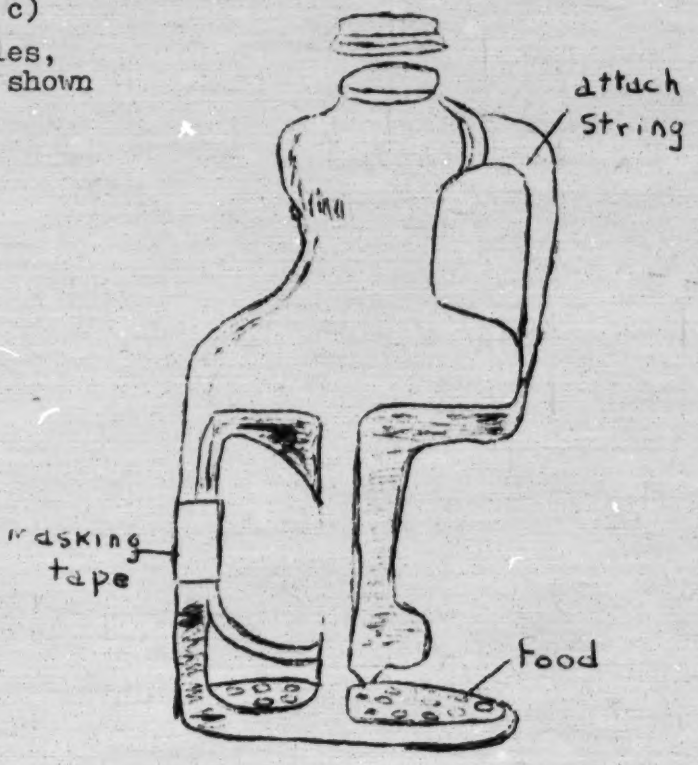

Diagram c

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HUMMINGBIRD FEEDERS

A hummingbird can use his long beak to extract a sugar and water mixture from a commercial feeding tube.

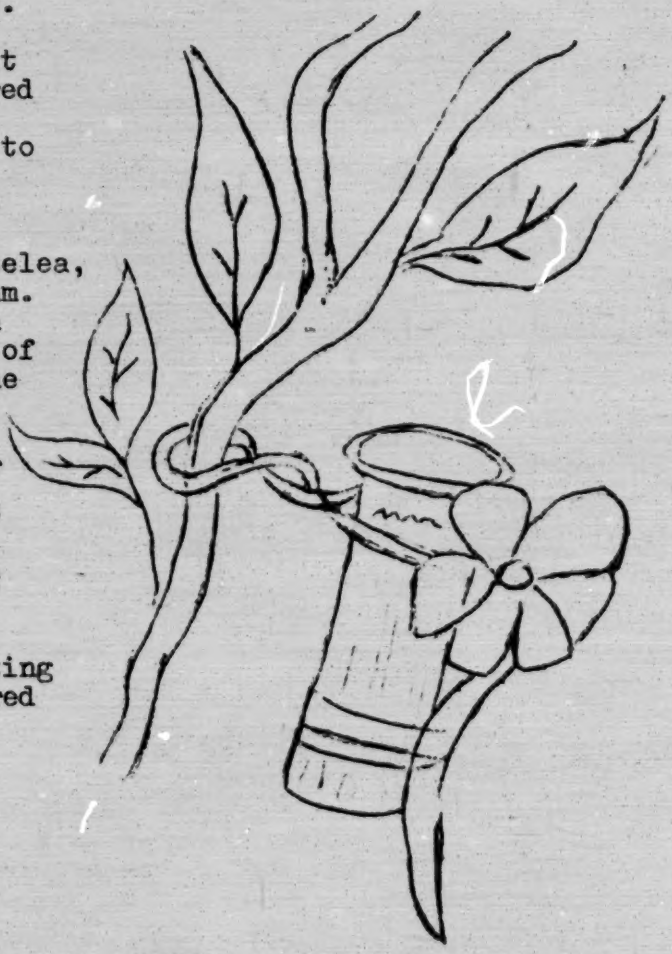
1. Find some type of commercial feeding tube, a test tube, or plastic pill vialwould work very well.

2. Meticulously clean the tube.

3. Decorate the tube so that it seems like a brightly colored flower, bright red ones in particular, are attractive to most hummingbird species. Some flowers that would attract the hummingbird are columbine, trumpet vine, azelea, morning glory and delphinium. These are the flowers which supply a nectar at the end of a tube-shaped blossom in the spring and summer.

4. Prepare a mixture of either
   a) 1 part honey to 3 parts boiled water
   b) 2 parts water to 1 part sugar

5. The food will be more exciting if colored with a drop of red vegetable dye.



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TROLLEY FEEDERS

Trolley feeders provide an ideal way of attracting birds to a window. The feeder should first be placed in an open space. After birds are in the habit of coming to it there, the feeder may be drawn with a wire, a few feet closer to the window each day.

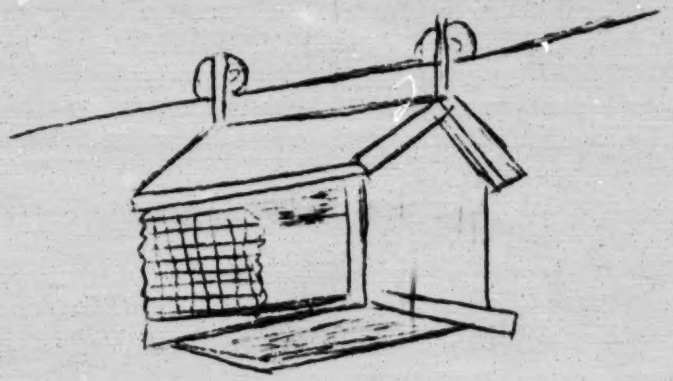
Directions:

1. Build the feeder about 12" high from feeding shelf to peak of roof; about 18" long; and about 12" wide. Cut end pieces so that roof slopes about 2" downward.

2. Fasten metal trolleys to roof, or to uprights at ends of the feeder if feeder is to be open.

3. Attach the suet cake holder and the wire suet cage to the wooden uprights.

4. Put nailing strip about 1½" high along edges of the tray to keep seeds from blowing away.



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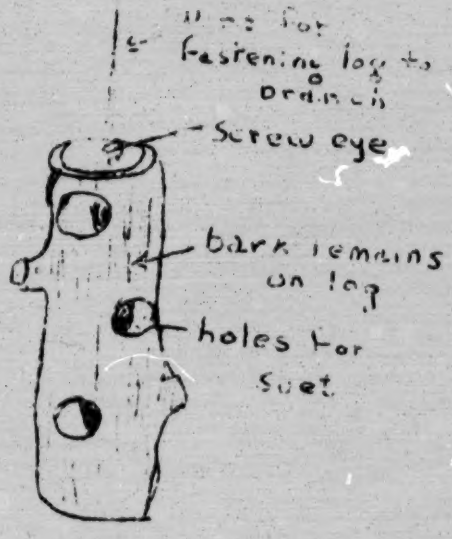
SUET FEEDERS

A. 1. Select a log about 4 inches across by 20 inches long.

2. Drill holes at least 1¼" deep for the suet.

3. Fill the feeder with suet.

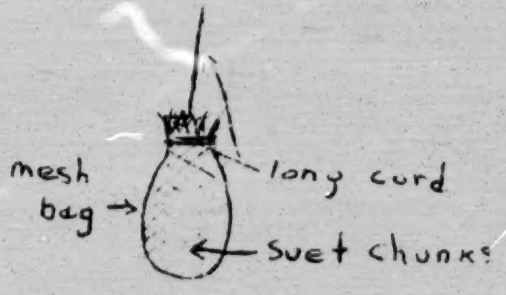
4. Turn screw eye into top of log. Attach wire to hang from branch.



B. 1. Find a mesh bag, such as an onion bag.

2. Place suet chunks in bag and tie top shut with a long cord.

3. Hang cord from a branch.



C. 1. Select a large dixie cup or pint milk container.

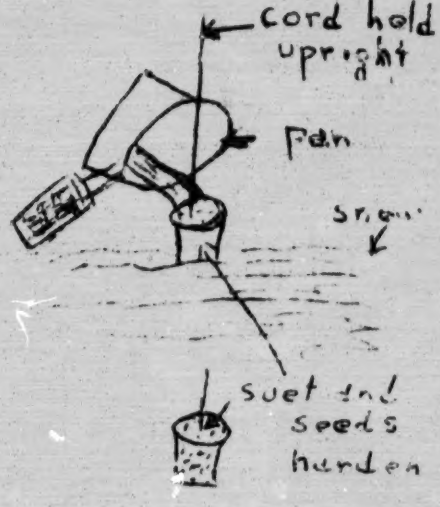
2. Melt suet.

3. Knot a cord through the bottom of the cup or container.

4. Place the cup in a depression in the snow. Pour 1 liquid suet and seeds in cup.

5. Hold string upright until suet hardens.

6. Tear away the paper cup and hang the feeder on a branch.



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ACTIVITY: The Water Cycle

PURPOSE: To reinforce the concept of the water cycle.

CONCEPTS: 9, 13

OBJECTIVE:

1. The student will be able to label the steps of the water cycle.

LEARNING ACTIVITY:

1. The teacher could present the class with the following work sheet.

The Water Cycle

Water is our most valuable renewable resource. All life is dependent upon water for survival. Man has many uses for water. The freezing and thawing of water helps break rocks into smaller particles that eventually become soil. Water helps lead nutrients down into the soil so plants can use them. Water in the soil is used by plants to manufacture food.

Water renews itself through the water cycle. The elements that make up the weather (heat, pressure, wind, and moisture) cause precipitation, evaporation, and condensation in an endless cycle.

Because of heat, water in lakes and oceans evaporates and rises into the atmosphere. Here it cools and condenses, forming clouds which are blown by the wind. When clouds have too much moisture, it starts to rain. As the rain falls to the ground, some of it soaks into the ground and is stored in underground streams, caverns or in air spaces between soil particles. Underground streams often form springs when they reach the surface of the earth.

The water that does not soak into the ground runs off into streams or lakes and eventually into the oceans where some of it evaporates and returns to the air to form clouds again, repeating the cycle.

Plants also lose water through the leaves by a process called transpiration. Transpiration in plants is similar to perspiration in people.

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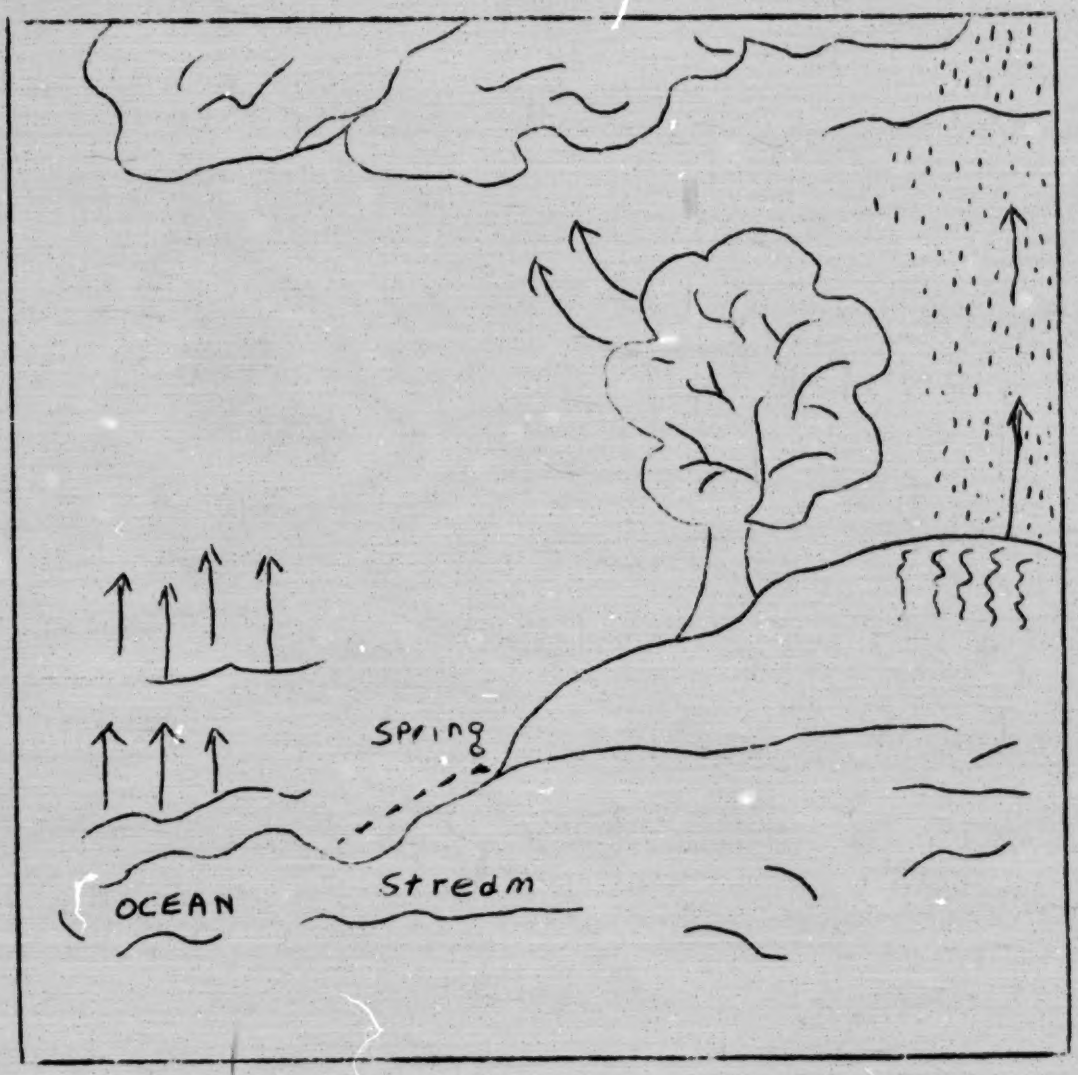

Lable this picture of the water cycle, showing evaporation, run-off, ground water and precipitation.

New terms to be learned:

evaporation
transpiration
ground water
condensation
precipitation

Suggested follow-up:

Study of communities Water System
Stream Study
Discuss how man may interrupt the water cycle.

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ACTIVITY: The Olympics of Outdoor Education

PURPOSE: To involve students in a group activity that covers many disciplines and relates to nature.

CONCEPTS: Concepts vary depending upon what each group uses and does.

OBJECTIVES: The students will become actively involved in a group activity and:

1. will perform in front of a group.
2. will study a natural object intensively.
3. will come up with creative answers.
4. will be involved actively in concepts of several discipline areas.

LEARNING ACTIVITY:

The following activity is designed for three teams of five participants but could be adapted to more teams and or more or fewer participants on each team. Different events or more events could be used.

Worksheet - An outline of the activity and worksheet are on the next pages.

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The Olympics of Outdoor Education

The Olympics will be held with three teams competing: U. S. A., U.S.S.R., and Kenya.

1. Each team is to go outside, find a natural object which can be used without environmental damage, and bring it inside.

2. Each team is responsible for one member competing in the following events pertaining to the natural object:

1.	Uses of it	1.2 d/d (degree of difficulty)
2.	Explain its ecological niche	1.7 d/d
3.	Write a short story about it	2.0 d/d
4.	Write a poem about it	2.5 d/d
5.	Write a song about it	3.0 d/d

3. Each team is responsible for providing a judge, other than the competitor for each event.

4. Teams have 45 minutes to prepare for competition.

Judging

Each event will be judged by five experts representing the following countries: U.S.S.R., U.S.A., England, Kenya, and Poland

The judges will score each participant on a scale of 1 - 10 with the high and low score being thrown out, add the remaining scores and multiply by the degree of difficulty. Individuals will be judged on the following categories:

1. Originality
2. Method of presentation
3. Content

Team scoring will be obtained by adding all the individual team member scores.

Awards

Medals will be presented to the first, second and third-place individual in each category.

Awards will be given to the first, second and third-place team.

Activity

This activity could be adapted to many classroom situations, especially rained-out field trips, days before vacation, review days. The activity touches the following areas: outdoor education, creativity, math, language arts, ecology, aesthetics, speech, sociology, international relations, and sports.

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Olympics of Outdoor Education
Score Card

Team: U.S.S.R.

Event	Individual	Scores	d/d	Total
1. Use	_____		x 1.2	_____
2. Niche	_____		x 1.7	_____
3. Short Story	_____		x 2.0	_____
4. Poem	_____		x 2.5	_____
5. Song	_____		x 3.0	_____
			Team Total	_____

Team:

Event	Individual	Scores	d/d	Total
1. Use	_____		x 1.2	_____
2. Niche	_____		x 1.7	_____
3. Short Story	_____		x 2.0	_____
4. Poem	_____		x 2.5	_____
5. Song	_____		x 3.0	_____
			Team Total	_____

Team: Kenya

Event	Individual	Scores	d/d	Total
1. Use	_____		x 1.2	_____
2. Niche	_____		x 1.7	_____
3. Short Story	_____		x 2.0	_____
4. Poem	_____		x 2.5	_____
5. Song	_____		x 3.0	_____
			Team Total	_____

ADDITIONAL RESOURCES

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ADDITIONAL RESOURCES

REFERENCE MATERIALS

Environmental education materials may be borrowed from the ECO-Center resource center by Carroll County schools. A bibliography of materials is available in each school's library or from the ECO-Center upon request.

RESOURCE PERSONNEL

A directory of Carroll County educational resources is also available in each library. The directory lists resource people and places in the county. See the appendix for an example.

A-V MATERIALS

A kustubg if Audio-visual materials at the reference center is contained in the bibliography. Additional free loan film sources are also listed.

FILMSTRIPS

Each participating school district has been provided with a filmstrip and cassette set entitled Concepts in Ecology by Centron. The four filmstrips may be used by themselves or in conjunction with classroom lessons. The four filmstrips are: Life in a Pond, Life in a Log, From Rock to Forest, and From Sand Dune to Desert. Each filmstrip has a cassette to interpret the pictures.

The general purpose of the filmstrips is to be helpful in the teaching of the following concepts: living communities change, living things interact, living things require energy, and living materials cycle through the community.

I. Concept: Living communities change. All living communities change with the passage of time. The mere fact that an organism lives and utilizes materials means that it alters the environment to fit its needs. The new environmental conditions brought about by these changes makes it possible for other kinds of organisms to move in. The nature process by chich communities of plants and animals change with time and often completely replace one another is called succession. All communities progress by such developmental stages until they reach a more or less stable equilibrium with the climate. The last stage is a climax community. This community may be upset and turned back to an earlier stage by a change in climate, natural catastrophes, or man-made disturbances.

II. Concept: Living things interact. No plant or animal lives in a vacuum for the action of one individual affects the lives of others, directly or indirectly, It is the diversity of these interrelationships that accounts for the stability of the community. Organisms interact through their basic needs for obtaining food, air and water.

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III. Concept: Living things require energy. All living things must have energy and sunlight provides all the energy needed. The sunlight that plants use is the basic fuel for all life. The energy passes up the food chain where it is lost as heat energy in maintaining life processes. Thus earth depends on a continuous input of energy from the sun.

IV. Concept: Living materials cycle through the community. All living organisms require the continuous use of essential raw materials which are cycled through the community in the form of elements contained in food, soil, air and water. The earth is a closed system and life can persist only as long as essential materials are continually cycling through living systems.

The filmstrips cover succession, show the interdependence of life, and the natural changes leading to a climax community.

FILMS

In addition to the filmstrip set, the following films have been reserved for fifth grade use.

The following summarizes concepts covered in each film:

A NATION OF SPOILERS:

This film hits hard at the vandalism and litter that have turned a portion of America into a visual disaster. The examination opens with typical scenes such as roadside litter, garbage-strewn campgrounds, vandalized restrooms, etc. Scenes are accompanied by "America the Beautiful". The film then shifts into an analysis of the general emotional immaturity of such acts. The objective of the film is to show the student the irresponsibility of such acts.

SPRING MARSH

A presentation of wildlife scenes filmed in marsh primarily in the state of Michigan. This film stresses the importance of the marsh as a refuge and a stopover point for many kinds of wildlife. The photography covers a full season from spring until fall so that we can observe the rich life of the marsh and the newly born as well as the mature adult creatures. Spring Marsh emphasizes the need for maintaing marshes because of the great diversity of life which they sustain.

EE-YI-EE-YI-OH

Subject area: Science, environmental science, social studies. This film is a revealing and potent satire of the animated cartoon fable Animal Farm, directly on our society's approach to the problems of pollution.

Four purposes:

1. Reveals society's effort to combat environmental pollution.
2. Illustrates the value of good sense toward solving the problem of pollution.
3. Points out specific successful solutions to certain kinds of pollution.
4. Shows that environmental pollution can be controlled.

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FILMS (cont'd)

CONSERVING OUR ENVIRONMENT: USE AND REUSE

How does a living organism relate to its environment? Dean learns about the ecological system of the earth as he observes the ecological system of a fishbowl. He discovers how man relates to his environment, how he uses it, destroys it and restores it.

ECOLOGY PRIMER

Ecology Primer is aimed primarily at young people, and is a fine introduction to the subject. It is straightforward and informative, with Dennis Weaver narrating. At the film's end he offers practical advice, consume less and join environmental groups which can put pressure on government and business. Such advice is hardly earthshaking, but it is a specific message that contains the beginning of a plan of action for a specific group of people.

NATURE'S EVER-CHANGING COMMUNITIES

The film uses scenes of nature to discover and study the concepts of "renewal", "change", and interdependence in the natural world. Interdependence is studied in a natural community by examining the living and non-living elements in the area.

WINTER: THE STORY OF SURVIVAL

A simple study of the winter season and the various ways in which plants and animals survive its rigors. Deciduous trees are contrasted with evergreens. Animals are shown that hibernate, migrate and struggle to live through the severe winter.

APPENDIX

Contains:

- Parent letter
- Permission slips
- Checklists
- Bus Activities
- Vocabulary Material
- Directory of Resources example
- Tests

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Dear Parents:

You have read or heard of the Upper Mississippi River ECO-Center which has been established with Title III - ESEA funds and which has headquarters at Thomson. The purpose of the Center is to study the relationship of man and his environment. While eventually all school children will be involved in the program, this year's emphasis is being put on the fourth, fifth, and sixth grade.

Briefly what we are trying to do is to develop a knowledge of, love of, and appreciation for the out-of-doors, show how the environment affects man and how man affects the environment, and to make the pupils aware of what they can do in maintaining the delicate balance between man and his environment.

The idea is not to introduce a new subject into an already overcrowded school program, but to coordinate the study with their present subjects.

We hope your child finds this an enjoyable experience which he can share with you and the other members of the family and that you give him every encouragement possible.

During the year we will be taking one or more field trips. Each child must have a parent permission slip for each trip. This is important for no child may go on a trip without the parents' consent.

It is important that all children be properly and adequately dressed. This means slacks (no shorts) for the girls at all times, and protective shoes with socks. For winter field trips warm coats, caps, mittens, and boots are necessary. If the day is very cold heavy underwear (or two pair of slacks) and extra sweaters and scarfs are suggested.

At times the children will have to carry sack lunches. A place to keep them will be provided, but each lunch should be marked with the pupil's name. Water will be available; if your child desires anything else they should bring their own.

You understand, of course, that at all times the children will be supervised by the home room teacher and one or more members of the staff. A first aid kit is included with the equipment for each trip. Please inform the home room teachers of any special allergies or disabilities.

We sincerely hope this will be a most interesting and meaningful year.

The UMECO Staff.

Dennis Etnyre

Bruce Floyd

Helen Whitney

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Dear Parent:

Your child will soon be having his/her second field experience conducted by the ECO-Center. This will be an all-day trip, so a sack lunch will be necessary.

This trip includes a visit to Lock and Dam 13, Thomson Public Use Area, the housing development along the river north of Thomson, and the Wildlife Refuge.

As the children will be doing some hiking and will stand in exposed areas warm clothing is necessary. We also recommend boots so they can keep their feet dry.

Each child must have a consent slip. Will you please fill out the slip and return it to the room teacher before the trip?

The ECO-Center Staff

_____ may attend the ECO-Center field experience on _____.

Signed_____
(Parent or Guardian)

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PERMISSION SLIP

My son/daughter _____ has
(Name)

my permission to go to _____
(destination)

on an educational field trip on _____
(date)

Signed _____
(Parent or Guardian)

PARENT CHECK LIST

A--DRESS

1. Long Sleeved Shirt
2. Old Pants or Slacks
3. Old Shoes or Boots (socks with both)
4. Warm Coat, if weather is BAD
5. Sack Lunch (?)
6. Inform teacher of special allergies or medication.

* BOOTS NECESSARY IN SNOWY AND WET WEATHER.

Have you signed the permission slip?

PLEASE RETURN TO THE TEACHER PROMPTLY.

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CHECK LIST FOR TEACHERS

1. Permission from principal
2. Permission slips
3. Adequate and proper clothing
4. Arrange own transportation
5. Administration permission
6. Time of departure and return
7. List of pupils with special allergies or disabilities
8. Lunches if sack lunch is required
9. Prearranged signal for calling class together.

.....

Please fill out and hand to leader.

Date of trip _____

Time of departure _____

Time of Return _____

Name of pupil(s) with special allergies or medication:

_____

_____

_____

_____

Name of School _____

Name of Teacher _____

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BUS TRIP ACTIVITIES

The following are sample activities that could be used on the bus trip to and from field trips.

Litter Count

Have children count roadside litter on their side of the bus. It might be advisable to divide each side into three groups, one group taking the near, one the middle, and one the far roadside. Add the count and see which side found the most. This exercise may be varied by counting one specific item of trash.

Billboard Count

Different sides could count the billboards on their side of the road. Includes all visible from road.

Signs of Autumn

This is an individual exercise. Could also be used for other seasons.

While Riding on the Bus

1. Name 5 types of trash you saw along the highway.
2. When given the signal start counting cars; put down the number of cars counted. Record the number of persons in each car.
3. As you travel along discover two things that pollute the air.
4. How many billboards did you see from Shannon to Mt. Carroll?
5. Do you think billboards are good or bad? Give reasons for your answers.
6. There is a junk yard located between Savanna and Thomson. What could be done to make this junk yard more attractive? What could be done to eliminate junk yards?
7. Out of Savanna we will cross Plum River. Why is the water so muddy?
8. How much do you think it cost to properly dispose of a beer can that somebody threw along the highway?
   What are some of the things that go into the cost?
9. The roads that you are traveling on need repair. Who pays for the upkeep?
10. What is the meaning of the word "ecology"?

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Alphabet Game

Divide the class into two teams. Each team watches for nature objects beginning with consecutive letters of the alphabet, such as "apple tree, blue jay, creek..."Whichever team completes the alphabet wins.

I Went to the ECO-Center and I Saw

Start the game by saying, "I went to the ECO-Center and I saw a cricket." Each child in turn repeats the beginning of the sentence and adds on another thing seen, as "I went to the ECO-Center and I saw a cricket and a hawk." The list could be made alphabetical. This activity would be best for THE RETURN TRIP.

I Spied

Children may take turns describing something seen during their field trip. The child who guesses what is being described gets to describe the next object. This may be done in team form.

Watching for Points

In advance, make a list of nature objects which may be seen from the bus. Give each a point value. Divide the class into two teams (one on each side of the bus, or where two are sitting in a seat, they may compare). Points are given to the team sighting each object first.

In advance make up a list of various map symbols. Give each symbol a point value. As the bus passes landmarks which would be identified by symbols on the list, children check off the symbols. At the end of the trip the team (or individual) having the highest score wins. (Children should be prepared to tell where they saw a landmark if their scores are challenged.

Highway Bingo

Make up a bingo sheet of objects likely to be seen along the road. Winners could be either those completing a row first or black-out bingo by completing the entire card. Crayons could be used to mark the cards or a blunt piece of wood to punch out answers. This would eleminate sharp pencils.

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VOCABULARY

Given one school year 80% of the pupils will have increased their understanding of environmental vocabulary terms by an increase in the mean score by 7 points on a pre-post test basis.

ATMOSPHERE:	The mass of air surrounding the earth
CONSERVATION:	Planned management of natural resources to prevent permanent damage
CONSUMING:	Using
CULTURE:	The way the people of a particular country act or think at a given time time
CYCLE:	Series of events that recur regularly and usually lead back to the starting point
DECAY:	To destroy by rotting or decomposition
DEPLETION:	The act of emptying or using up
ECOLOGY:	A branch of science dealing with the interrelationship of plants and animals
ENERGY:	The ability to do work
ENVIRONMENT:	Everything around an organism
EROSION:	The process of wearing away
EVAPORATION:	A liquid changing to a vapor
EVOLVING:	Natural changing
EXTINCT:	No longer existing
FOSSIL:	Remains of a plant or animal which has been preserved in the earth's crust
HABITAT:	The place where a plant or animal naturally lives
HUMAN:	Man
INTERDEPENDENCE OF LIFE:	Plants and animals relying on each other
MULTIPLE USE:	Having more than one use

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VOCABULARY

NON-RENEWABLE:	Not being able to be made new again
NATURAL RESOURCES:	Usable materials produced by nature
ORGANISM:	Living plant or animal
POLLUTION:	Something that makes an item impure or unclean
POPULATION:	The whole number of the same kind of plant or animal living in an area or region
PRECIPITATION:	Material containing water being dropped on the earth (Rain, snow, sleet, hail or mist)
PRODUCER:	Green plants that take the sun's energy, water, air and minerals, and makes food
RECREATION:	To play or relax
RECYCLED:	Returned to be used again
RENEWABLE:	That which can be made new again
SEWAGE:	Human waste matter carried off by sewers
SOIL:	Upper layers of the earth's crust
SUCCESSION:	The natural process of nature changing

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ECO-CHATTER

This game is designed to be coordinated into the language arts program for use in spelling and word meaning.

OBJECT OF THE GAME: To enhance the student's knowledge and understanding of environmental vocabulary words.

HOW TO PLAY: Choose 6 teams of 4 players or any other combination. Give each team a packet of blank cards, 3 x 5 index cards can be used. The teacher shall call out a word from the list of environmental vocabulary words and each team has one minute to write the correct spelling down on their card. When time is up each team shall hold up its card and the teacher or checker shall see if the word is spelled correctly. If they have spelled the word correctly, that team is awarded points. (See enclosed point list.) The students are next asked to write the definition on the back of the card, one minute or more for this step. After the time limit is up, the teams should show their cards to be checked by the teacher or checker. If they have the correct definition they are again awarded points. (See enclosed list of points) A winner is determined by the number of points accumulated either at the end of a pre-determined time period or a pre-determined total goal to be achieved.

WORD LIST

WORD	PTS FOR SPELLING	PTS FOR DEFINITION
Atmosphere	5	3
Conservation	5	4
Consuming	4	2
Culture	3	5
Cycle	5	3
Decay	3	3
Depletion	5	4
Ecology	3	3
Energy	3	2
Environment	5	3
Erosion	3	4
Evaporation	3	5
Evolving	5	2
Extinct	4	2
Fossil	3	3
Habitat	4	1
Human	1	5
Interdependence of Life	5	2
Multiple Use	4	2
Natural Resources	5	3
Non-Renewable	4	1
Organism	4	5
Pollution	2	2
Population	2	2
Precipitation	5	3
Producer	2	3
Recreation	3	1
Recycled	3	3
Renewable	2	2
Sewage	3	3
Soil	1	1
Succession	4	4

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VOCABULARY TEST FOR FIFTH GRADE

MATCHING

1.	conservation	a.	everything around an organism
2.	consuming	b.	green plant that uses the sun's energy to make food
3.	decay	c.	the place where a plant or animal naturally lives
4.	evolving	d.	waste matter carried off by sewers
5.	fossil	e.	planned management of a natural resource to prevent permanent damage
6.	habitat	f.	remains of a plant or animal which has been preserved in the earth's crust
7.	interdependence of life	g.	not being able to be made new again
8.	organism	h.	upper layers of the earth's crust
9.	population	i.	plants and animals relying on each other
10.	producer	j.	the whole number of the same kind of plants or animals in an area or country
11.	sewage	k.	using
12.	soil	l.	natural changing
13.	succession	m.	to destroy by rotting or decomposing
14.	non-renewable	n.	living plant or animal
15.	environment	o.	the act or process of following in order

True or False

Place a T in front of the statement if it is true. Place an F in front of the statement if it is false.

1. Atmosphere is the whole mass of air around the earth.
2. Cycle is a series of events that recur regularly.
3. Depletion is the act of filling up something.
4. Ecology is the study of our feet.
5. Energy is the ability to do work.
6. Erosion is the process of building up.
7. Evaporation is the process of adding on or making visible.
8. Extinct is no longer existing.
9. Multiple use means to have only one use.
10. Natural resources are resources made by both man and nature.
11. Pollution is something that makes an item impure or unclean.
12. Precipitation is that which comes in the mail.
13. Recreation means to play or relax.
14. Recycled means the object is returned so it can be used again.

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EDUCATION RESOURCES DIRECTORY - Carroll County

The directory is available from the Upper Mississippi River ECO-Center. The directory lists people and places willing to share with your class their expertise in business, industry, farming or hobbies. Sites for field trips are also listed. The directory is indexed by community and cross-referenced alphabetically by business.

* * * * * *

Outdoor Education

Place: Bluffville Outdoor Education Site

Address: Located two miles E of Thomson and one mile N on the Scenic Bluff Road, turn E on the Ideal Road and go to the end of the road.

Contact: Upper Mississippi River ECO-Center - Phone 259-3282 or Thomson C. U. District No. 301, Thomson, Illinois

Purpose: Outdoor Educational activities on the 80.5 acres of bluff acreage.

History: Early Bluffville settlement located on or near the property with remains of an old grist mill and the Ideal Road located on the property.

Specific (Example of Activities) Located on part of a bluff and stream bottom in a relatively isolated area. Basically hilly woods, open prairie and creek. The area is located in the Winnebago Glacial Drift area which makes it an area of historical value.

Unique Feature: Remains of the Bluffville settlement with a grist mill. Varied habitats; wood stream, marsh, hills and varied soils.

Field Trip or Classroom Experience: Field Trip

Age or Grade Level: Any grade level

Number of Pupils: Limit 80 per day

Available:
a. When? Anytime
b. To which schools? All
c. Day and hours? Anytime
d. How much advance notice? One day, longer if field leader is requested.

Remarks: Contact ECO Center for use, field trip leader may be available upon request.

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1974-75 TITLE III-ESEA

UPPER MISSISSIPPI ENVIRONMENTAL AWARENESS TEST

DO NOT WRITE ON THE TEST
Place all answers on the answer sheet.
Mark 'A' on your answer sheet if you think the statement is true.
Mark 'B' if you think the statement is false.

1. Natural resources are resources that man has made such as cars or plastics.
2. Non-renewable resources can be used again and again.
3. Man can change his environment very much.
4. Only green plants are able to capture the sun's energy and produce food.
5. Man always makes his environment better when he changes it.
6. We are using natural resources so fast that people in the future may not have enough.
7. The best way to preserve wildlife is to put it in zoos.
8. Natural areas, if left alone, stay the same.
9. Erosion is a natural process which man can do nothing about.
10. We are using our resources faster because we want more things and we want more trade.

For questions 11-20 mark on your answer sheet the letter above the word that means almost the same as the word in the left column.

		A	B	C	D
11.	Conservation	using	preserving	wasting	watering
12.	cycle	circle	square	circus	pamphlet
13.	precipitation	rainfall	springs	rivers	mineral resources
14.	returnable	throwaway	reusable	partway	turntable
15.	recreation	work	play	road building	school
16.	erosion	building up	precipitation	wearing down	spraying
17.	evolving	turning wheels	falling leaves	slowly changing	running water
18.	atmosphere	temperature	ground water	air	soil
19.	soil	stream	solid	cliff	earth
20.	pollution	waste	vacuum	atmosphere	running water

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Multiple Choice

For Items 21-30 mark on your answer sheet the letter of the words which make the sentence true.

21. A producer is

    a. an animal that eats plants (plant eater).

    b. an animal that eats other animals (meat eater).

    c. a fungus that eats off decaying material.

    d. a green plant that makes food.

22. Using the same forest area for lumber, camping, hunting, and hiking is an example of

    a. multiple use.

    b. zoning.

    c. succession.

    d. farming.

23. Taking care of natural resources to prevent destruction or neglect is called

    a. biology.

    b. conservation.

    c. multiple use.

    d. zoning.

24. Which terms best describe the water cycle?

    a. precipitation, run off, evaporation

    b. run off and erosion

    c. rain and cloud formation

25. The atmosphere affects

    a. only people working out-of-doors.

    b. only people working at night.

    c. everyone.

    d. only people in cold climates.

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(Multiple Choice-Cont'd)

26. Your environment is
    a. living things in your community.
    b. non-living things in your community.
    c. everything that is around you.
    d. the sun and its planets.

27. Ecology is the study of the relationships between
    a. living things and environment.
    b. man and weather.
    c. plants and animals.
    d. birds and bees.

28. Conservation is the responsibility of
    a. industry.
    b. farmers.
    c. teachers.
    d. everyone.

29. When a log rots its material is
    a. lost forever.
    b. returned to the soil to be recycled.
    c. turned into a fossil.
    d. evaporated.

30. Which of the following is the original source of energy on our earth?
    a. sun
    b. moon
    c. animals
    d. atomic generators

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MATCHING

For questions 31-35 indicate the letter of the word or phrase on the right that matches the word on the left.

31.	fossil	a.	natural power
32.	extinct	b.	plants and animals must have each other
33.	energy	c.	rock-like remains of a plant or animal of the past
34.	consuming	d.	no longer alive
35.	interdependence	e.	using

MATCHING

For questions 36-40 indicate the letter of the word or phrase on the right that matches the word on the left.

36.	organism	a.	materials obtained from the ground
37.	minerals	b.	can be used again
38.	decay	c.	living plant or animal
39.	recyclable	d.	the world around us
40.	environment	e.	the breaking down of something

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For questions 41-55 three answers are correct. Mark on your answer sheet the letter of the answer that is not correct.

41. Pollution may result from

a. frost killing plants.

b. not enough sewers.

c. people not trying hard enough to prevent it.

d. too much waste.

42. Soil should be

a. kept fertile.

b. abandoned when it won't produce.

c. built up.

d. conserved.

43. Living plants furnish material for

a. food.

b. clothing.

c. metals.

d. shelter.

44. People living any place

a. have no effect on the area.

b. always change it.

c. may change it greatly.

d. may change it very little.

45. Wildlife populations can be kept by

a. hunting when one wants to.

b. planning areas where animals can live naturally.

c. letting them increase naturally.

d. staying out of their natural areas.

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Mark on your answer sheet the letter of the answer that is <u>not</u> correct.

46. People can preserve natural resources by

a. using them as they want to.

b. careful planning for the future.

c. substituting something for the future.

d. reusing natural resources as much as possible.

47. Natural resources like coal and oil

a. are found only in certain places.

b. are not found equally in all countries.

c. may be sold or traded from one country to another.

d. are divided equally among all countries.

48. When we learn more about our environment we

a. can improve it.

b. control things that harm it.

c. try to make it better.

d. do as we please.

49. Water

a. may be used again if cleaned.

b. is easily contaminated or polluted.

c. may be used only once.

d. is important to all forms of life.

50. The number of people who can live in an area depends on

a. water.

b. food.

c. usable space.

d. wind.

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Mark on your answer sheet the letter of the answer that is not correct.

51. Water pollution comes from

a. industries.

b. cities.

c. farms.

d. marshlands.

52. People can help the environment by

a. putting all the blame for pollution on the factories.

b. using soil conservation practices on their farms.

c. picking up litter.

d. doing less burning.

53. The river is valuable to man because it can be used for

a. transportation of goods.

b. recreation.

c. dumping sewage.

d. commercial fishing.

54. A wildlife refuge closed area is a

a. place for hunters to shoot ducks.

b. sanctuary.

c. place to manage wildlife.

d. place to save endangered species.

55. Sewage plants

a. keep harmful wastes out of our rivers.

b. remove most pollutants from water.

c. provide drinking water for most cities.

d. safely remove wastes from our cities.

1974-75

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UPPER MISSISSIPPI RIVER ECO-CENTER
TITLE III-ESEA
ENVIRONMENTAL ATTITUDE INVENTORY

Directions: Place all answers on the answer sheet.
If you agree with the statement, darken the box under T.
If you disagree darken the box under F.

1. Most of our environmental problems have been solved.
2. People should recycle bottles, cans, newspapers even if it means more work for them.
3. There should be more people living in the world.
4. Waste vegetables and fruit peelings should be buried so that they can turn back into soil.
5. It's better to use land for highways than new parks.
6. Water pollution hurts only fish.
7. Industries that pollute should clean up even if people lose their jobs.
8. Cars should have engines that don't mess up the air so much, even if they're slower and cost more.
9. Most people use too much electricity.
10. This country needs more cars instead of mass transit like buses.
11. The best way to dispose of leaves is to burn them.
12. It's better to ride a car than to ride a bike a couple of blocks.
13. We need all of our electrical appliances.
14. Farming practices can cause pollution.
15. I like pop in one-way bottles because they are easier to dispose of than returnable bottles.
16. I speak up when people are talking about things that are harmful to the environment.
17. Americans should continue to use more of the world's resources.
18. People should be able to use land as they wish.
19. The rivers today are as clean as they ever were.
20. Most farmers could do more to stop the soil from washing away.

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For Questions 21-30 mark A if you think the person speaking is helping the fight for a good environment; mark B if you think the person speaking is harming the fight for a good environment, and mark C if the person speaking is neither helping or harming the fight for a good environment.

21. "We're a modern and progressive town," Mayor Nelson says proudly, "because in the last ten years our population has doubled."

22. "My stereo, TV, and hair dryer, don't use much electricity," Sally said, "so I don't have to worry about saving energy."

23. Dan's father said, "When we build we'll choose our lot carefully, leave the trees, and disturb the ecosystem as little as possible."

24. "I've been using this detergent for years," said Mrs. Smith, "and I'm satisfied with it. I'm not going to change. The little phosphate put into streams won't make any difference anyway."

25. "Fishing is better in Iowa than Illinois," Dave argues.

26. "Just throw your pop cans in the river," said Tom's mother, "then they won't be making a mess on the land."

27. "Pollution is all the fault of big factories and industries," Joe's father said, "I can't do anything about pollution myself."

28. "This country needs more food," said Ralph, "even if it means plowing up our hilly pasture land and increasing erosion."

29. "Money could be used for more important things than cleaning up our rivers and cities," said George.

30. "Motorbikes are fun because they make lots of noise," said Clarence.